ABERDEEN

COMPLETE NETWORK SOLUTIONS

USER'S MANUAL

Stirling X38sa / X38saR

Stirling X312

Stirling X316

Stirling X416

Stirling X524

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INTRODUCTION

Aberdeen LLC, the Custom Server Solution Provider, has provided an excellent selection of quality custom computing solutions to the IT professional for more than a decade. As an innovator of storage solutions Aberdeen has become a one-stop solution source for the IT Professional.

The computer industry is a continuously evolving marketplace. With a clear vision of the future, Aberdeen has become a trend setter via its vast technical experience and industry foresight. Aberdeen is a pioneer in providing customizable rack mounted servers, backup solutions and scalable NAS storage appliances.

Aberdeen Rackmount Storage Server applicable models.

- Aberdeen Stirling X38i “Backup Monster”
- Aberdeen Stirling X38iR “Backup Monster”
- Aberdeen Stirling X38sa “Backup Monster”
- Aberdeen Stirling X38saR “Backup Monster”
- Aberdeen Stirling X416 “TeraBuster”
- Aberdeen Stirling X524 “TeraStorus”

As an industry leader, Aberdeen not only reduces cost of ownership by offering the longest warranty in the industry, but also has demonstrated better performance and has proven to provide a better ROI than the competition in head-to-head comparisons.

ABERDEEN CONTACT INFORMATION

Aberdeen understands that service does not stop once a product ships. We sincerely hope there will never be a situation in which a problem arises; however, should there be a need for service, Aberdeen will be there to provide the prompt, courteous, and efficient service expected.

Headquarters

Address:	9130 Norwalk Blvd. Santa Fe Springs, California 90670
Telephone:	562-699-6998
Fax:	562-695-5570
Email:	GenSales@aberdeeninc.com
WWW:	www.Aberdeeninc.com

Customer Support

Hours:	Monday - Friday, 8am – 5pm PST
Telephone:	562-699-6998 ext. 152
Email:	CustomerService@aberdeeninc.com

Technical Support / RMA

Hours:	Monday - Friday, 8am – 5pm PST
Telephone:	562-699-6998 ext. 326
Email:	RMATech@aberdeeninc.com

5-YEAR WARRANTY TERMS AND CONDITIONS

Aberdeen provides an industry leading 5-Year Warranty on any of its fully configured rackmount servers. All Aberdeen fully configured rackmount solutions are warranted to be free of defects in materials for a period of five years from date of shipment or the lifetime of the product to be free of workmanship defects. A fully configured rackmount system is defined as a system, which in a single purchase includes the rackmount chassis, motherboard, processor(s) with appropriate cooling equipment, memory and hard disk drive(s) all assembled. This warranty does not cover any abuse, misuse or modification of products. We reserve the right to repair or replace the defective product under warranty as we see appropriate. We do not warrant uninterrupted or error-free operation of a product. We do not warrant that any product that you acquire will meet your individual requirements

"Aberdeen's warranty is 'REAL' and their response is immediate!"
- Customer testimonial; Mr. Tawfik Daoud, Maximus Inc.

MISSION STATEMENT

The Straight Talk People. - The primary business focus for Aberdeen is to be the IT professional's preeminent resource for complete network solutions, while remaining dedicated to building and maintaining excellent service and support relationships with its clientele.

COMPANY BACKGROUND

Founded in 1991, Aberdeen LLC is a leading direct marketer of rackmount servers, storage solutions, computers and computer hardware. Voted among The Direct 100 vendors by PC Computing magazine, Aberdeen designs, manufactures and customizes award-winning Aberdeen brand computer systems, Stirling rackmount servers, AberNAS storage appliances and backup storage servers. Aberdeen LLC provides assistance to its vast customer base in the planning, budgeting and implementation of complete network solutions including High-Performance Computing and NAS/SAN deployment within existing IT environments. For product sales, service or company information, contact Aberdeen at 800-552-6868, by fax at 562-695-5570 or visit www.aberdeeninc.com.

GOALS

To provide rack mounted server, data storage, and network solutions to the business, government, education and telecommunication sectors.

To continually offer a comprehensive selection of cutting-edge computer hardware components and be the single source for the most reliable and the best valued backend server networking solutions in the market.

To exceed its clients' expectations through dedicated one-on-one service, unequalled attention to detail, and custom solutions designed to overcome networking obstacles.

THE ABERDEEN ADVANTAGE

Aberdeen's consummate professional and highly experienced sales, management and technical teams are key elements in its ability to provide the finest complete network solutions and service available in the marketplace.

With unparalleled experience in the industry, Aberdeen has accumulated the expertise to design and custom configure any network ranging from a couple of workstations to a complete SAN/NAS network environment.

Aberdeen's ability to provide the best service and hardware availability is enhanced by its certifications and partnerships with the recognized leaders in the computer industry.

Company Certifications include:
- Microsoft Certified Partner
- Intel Premier Provider

Staff certifications and qualifications:
- Microsoft Certified Professional
- Microsoft Certified Systems Engineer
- Intel Certified Solution Consultant
- Intel Certified Integration Specialist
- Novell Unix and Linux Professionals

ABERDEEN LEADS INDUSTRY WITH 5-YEAR WARRANTY

Aberdeen is pleased to provide an industry leading 5-Year Warranty on any of its fully configured rackmount servers. Whether you select one of the pre-configured Stirling servers or custom design a complete server for yourself, it will be warranted to be free of defects in materials for a period of five years from the date of shipment and for the lifetime of the product to be free of workmanship defects.

CUSTOM SERVER SOLUTIONS PROVIDER

Aberdeen LLC has provided personal and corporate customers quality custom computing solutions for more than a decade. Customizable Stirling rack mounted servers, backup solutions and AberNAS storage appliances not only offer a longer warranty and demonstrate better performance, but have proven to provide a better ROI than the competition in head-to-head comparisons. Aberdeen offers a comprehensive product line for the Gaming Enthusiast to the IT Professional.

- Fully Customizable Rackmounts, Servers, Chassis and Systems
- Full Network Solutions and Rackmount Server Cabinet Models
- NAS/SAN Mass Storage Solutions Units and Appliances
- RAID protected Disaster Recovery and Backup Servers
- Governmental, Educational and Corporate Workstations
- Complete Server Solutions for Microsoft, Unix and Linux platforms
- Industrial PC Components; Data Acquisition, SBCs and Backplanes
- Hand Held & Modular Hard Drive Duplication
- Comprehensive line of PC Hardware

REFERENCES

Over the years Aberdeen LLC has been privileged to work with companies that share similar expectations and professional goals to its own such as unmatched customer service, personal and professional integrity, honest communication and the commitment to forming long-term partnerships.

The innovative Stirling “Backup Monster” storage server impressed Tawfik Daoud, senior system engineer of Maximus Inc. enough to praise Aberdeen in a recent letter. Mr. Daoud mentioned that he chose Aberdeen since the “Backup Monster” costs considerably less than the closest competitor and was “amazed” with the ease of implementation and performance. Mr. Daoud goes on to write in his testimonial.

"The "Backup Monster" is one step ahead in the backup industry and what I like most is that Aberdeen is backing it up."

The Stirling S21 Server appealed to David Featherstone, a network administrator for Timber Products, a company of 1,500 employees, who told PC Magazine how happy he is with the Stirling brand server and that he plans to purchase more in the future.

"Over the years, I've tried everything," Mr. Featherstone says. "I have built my own servers, or bought them from major vendors, but I really like these. The value you get for your money is impressive."

Satisfied clients are the best reference for Aberdeen. Below includes a sample of some of the world-class companies whose rack mounted server expectations have been exceeded by Aberdeen to the point that they have become frequent repeat customers.

Adventists	Intel	Ohio State University	University of Michigan
Boeing	Lockheed	Paramount Pictures	University of Washington
Computer Sciences Corp	Microsoft	Penn State University	US Army
Cornell University	Motorola	Raytheon	US Navy
Central Intelligence Agency	Northrup Grumann	Stanford University	Vanderbilt University
Dow Chemical	Novartis Pharmaceuticals	Timber Products	Verizon
IBM	Oak Ridge National Lab	UC Lawrence Berkeley Lab	Virgin Entertainment

REVIEWS AND AWARDS

Throughout the years Aberdeen LLC has received praise and critical acclaim for custom built servers and desktop systems. Take a look at these recent comments about Aberdeen Stirling Servers from - ***PC Magazine.***

"The Stirling S17 Merits an Honorable Mention" - ***PC Magazine 2003***

"The least expensive Intel-based server in our roundup, the Aberdeen Stirling S17 offers a lot of power and scalability for the money." - ***PC Magazine 2003***

"We were impressed with the Stirling S17's performance; it generally led the pack in test results" - ***PC Magazine 2003***

"Astonishingly Low Price. Inexpensive, Hardworking Server the Aberdeen Stirling S21 is a good choice." - ***PC Magazine 2002***

"With an Unrivaled five-year warranty … (the Stirling S21) offers comparable components and performance (to IBM)." - ***PC Magazine 2002***

PREVIOUS COMMENTS FROM THE EXPERTS

"The Claymore D90G is the fastest PC we've seen so far." - ***Maximum PC 2001***

"There's No Mystery Here- This One's a Beast … Aberdeen's Loch Ness machine is a tower of power." – Loch Ness D80G - ***Maximum PC 2001***

"Aberdeen shows us what a real gaming system should be all about with its latest computer." – Loch Ness D45G - ***PC Gamer Editors' Choice 1999***

APPENDIX - A

BACKUP MONSTER X38

ABERDEEN STIRLING X38SA

Incomparable
Aberdeen is proud to announce the revolutionary all inclusive storage and backup hybrid solution, the Stirling X38. This newest addition to our world famous line of Stirling Servers is the only SATA hot-swap 3U rackmount server that can store up to 2 Terabytes of data. This "Backup Monster" is suited to be the perfect solution for the IT Manager looking to find a beefy backup storage solution at the most affordable price available.

Stirling X38

Our "Backup Monster" costs as little as 1/10th the cost of a backup solution by any other company. This magnificent machine clearly surpasses any server on the market. This beast can be featured with either 8 SATA disk drives for the cost conscious IT Manager or provide increased storage capacity with additional XDAS scalable arrays. The Aberdeen Stirling X38 features the newly released Intel E7520 chipset (Lindenhurst) featuring PCI Express and DDR2 capability, Extended Memory 64 Technology (EM64T), and an 800MHz processor system bus to support the latest Intel Xeon (Nocona) dual processors with 1MB L2 cache and 800 MHz system bus for servers and workstations. The SATA Aberdeen Stirling X38 comes with 8 hot-swap drive bays, dual Gigabit LAN, 64 bit Raid controller and has space for an internal tape backup drive and a CD-RW drive. Housed in an ultra-dense 3U chassis and utilizing the Intel E7520 chipset, it guarantees the most computing power in any 3U platform, and by design the Stirling X38 provides scalability for any enterprise looking for the ultimate storage and backup solution.

Available with Dantz Retrospect Backup Software.

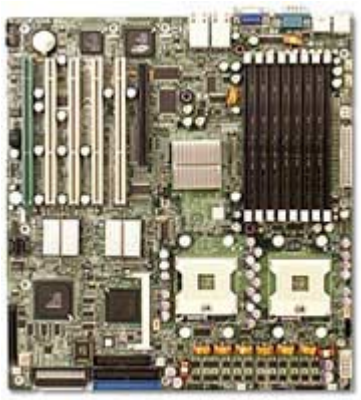
NAS AVAILABLE

X38SA SPEC SHEET

ABERDEEN STIRLING X38 RACKMOUNT
"BACKUP MONSTER" SERVER

MANUFACTURER PART#	SRVX38 **BLACK RACK**
ABERDEEN PART#	SRVX38
PROCESSOR	Dual Socket 604 Supports Dual Intel® Xeon processors Front-Side Bus support for 533MHz or 400MHz Onboard 3-phase switching power regulator
CHIPSET	**ServerWorks. Grand Champion. SL chipset**
SYSTEM MEMORY	8 x 240-Pin DIMM Sockets **Up to 16GB DDR2-400 registered ECC** **Dual channel memory bus** **ECC Registerd DDR2 SDRAM ONLY** 2-way interleave provides outstanding performance (memory must be used in pairs)
ON BOARD I/O	1 x Floppy Connector 2 x Serial 16550 compatible ports 2 x USB 2.0 Ports PS/2 keyboard and mouse ports
ON BOARD IDE	Dual EIDE ports support Ultra DMA 100MB/s of Burst data transfer rate, supports UDMA Mode 5, PIO Mode 4 and ATAPI
VIDEO	ATI Rage XL 8MB PCI graphic controller
ON BOARD LAN	**Intel 82546GB Dual Gigabit controller** 2 x 10/100/1000 ports
SATA RAID	**3WARE Escalade 9500S 8-Port SATA150 RAID** SATA backplane provides power, bus termination **8 Hot-Swap/Hot-Spare SATA150 drive bays** StorSwitch™ non-blocking architecture for reliable, scalable, and high-performance hardware RAID isolation. **RAID 0, 1, 10, 5, and JBOD support** SCSI performance feature set
SCSI CONTROLLER	**LSI Logic 21320 Dual Channel Ultra320 SCSI card** External Wide SCSI connector (available connectors for internal or external SCSI tape drives)
SCALABLE SOLUTION	Connects to Aberdeen XDAS Direct Attached Storage Device **Connect up to 3 devices with SCSI port.**
PC HEALTH MONITORING	Onboard voltage monitors for CPU Fan status Environmental temperature monitor and control Chassis and CPU overheat alarm, LED indication and control System resource alert Supermicro System Management utility
BIOS	AMI® BIOS on 4Mbit Flash ROM User settings for hardware monitoring Auto-configuration of IDE hard drive types Multiple boot options
EXPANSION SLOTS	1 x (x8) PCI Express Slot **Total of 5 PCI-X** (1 x 64-bit PCI slot populated w/3Ware controller) (1 x 64-bit PCI slot populated w/LSI SCSI controller) (3 x Empty 64-bit PCI-X Slots)
BOARD SIZE	Full ATX 12" x 9.6" in.(W x H)
EXPANSION BAYS	1 x 3.5" drive bay 1 x Slim 5.25" drive bay 2 x 5.25" drive bays 8 x 3.5" x 1" drive bays
CHASSIS FEATURES	19" rackmount ATX (3U height, 25.4" Depth) **550W Power Supply or** **760W Triple Redundant Hot-Plug** Auto-switching 100/240V AC power 4 x 5000 RPM Hot-swappable Cooling Fans 2 x 5000 RPM Rear Exhaust Fan LED indicators for power on, network activity, IDE HDD activity Power ON/OFF and system reset switches

Includes 1 x 3.5" floppy drive
Slim CD-Rom Drive
Rackmount Rails



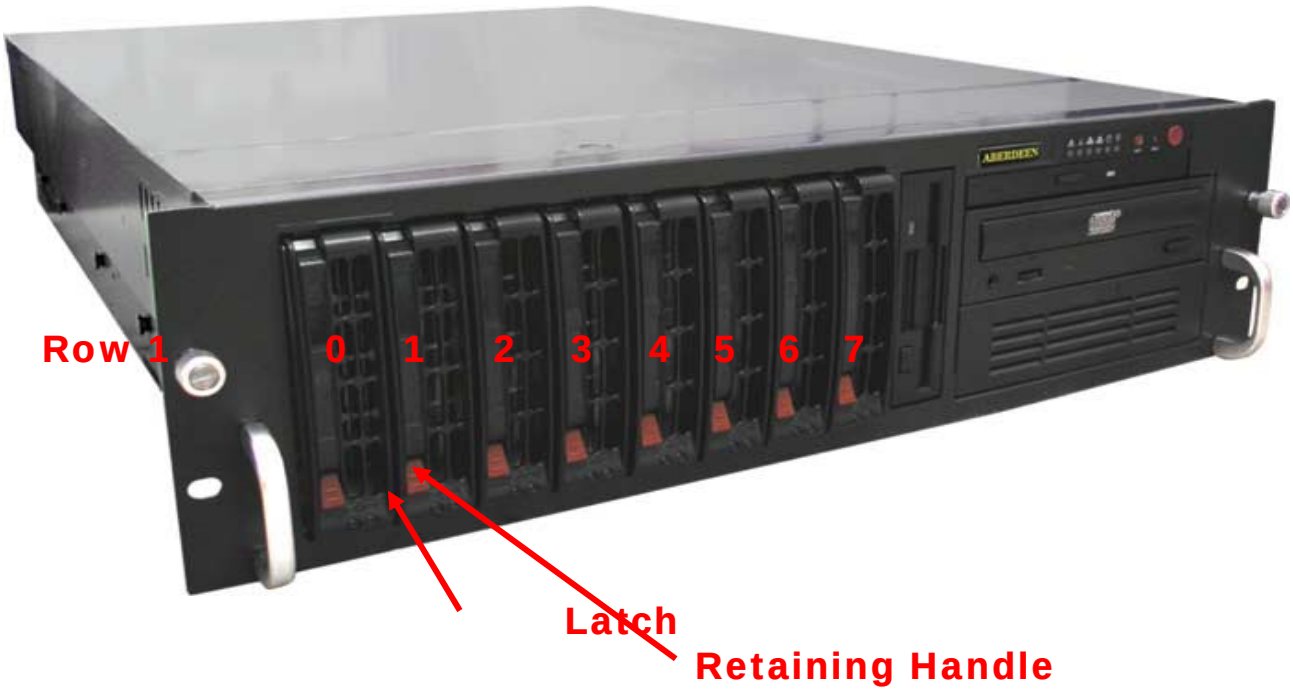
X38SA DISK PLACEMENT CHART

WARNING – The disk drive trays must be properly seated completely back into their sockets and they must be in their proper positions in order to avoid software corruption and/or hardware damage.

Please carefully read the following:

Your server has a row of eight hard disk drives. The row is numbered from left to right. For safety during shipment to you, the drives have been removed and shipped separately.

The number stickers on the hard drive packages correspond to their placement in the chassis. Proper placement of the drives is critical in retaining the integrity of any software or operating system that has been loaded.



Slide the hard drive into place with the retaining handle extended. When the drive is fully inserted, push the retaining handle back until it is fully seated and snapped into the latch.

Should you require technical assistance with this or any other aspect of your Aberdeen server, contact us toll free at (800)552-6868 option 3 from 8:00am to 5:00pm PST.

APPENDIX - B

BACKUP MONSTER X312

ABERDEEN STIRLING X312

Dantz Retrospect
Backup Software.

NAS AVAILABLE

INCOMPARABLE:
Aberdeen is proud to announce the improved capacity all inclusive storage and backup hybrid solution. The **Stirling X312** is a condensed version of the original revolutionary "Backup Monster" model. By sacrificing one of the two available 5.25 bays the X312 can pack up to 4.8TB & continue to have room for a tape backup device. As with our world famous line of Stirling Servers, this hot-swap 3U rackmount server that can store data disk to disk and provide the ability for additional tape backup. This Super "Backup Monster" is suited to be the perfect hybrid solution for the IT Manager looking for a storage solution at the best cost per TB ratio.

Our Super "**Backup Monster**" costs as little as 1/10th the cost of a backup solution by any other company. This magnificent machine clearly surpasses any server on the market. This beast can be featured with SATA disk drives for those that require the most computing power possible. The **Aberdeen Stirling X312** features the newest Intel E7520 chipset (Lindenhurst) featuring PCI Express and DDR2 capability, Extended Memory 64 Technology (EM64T), and an 800MHz processor system bus to support the latest Intel Xeon (Nocona) dual processors with 1MB L2 cache and 800 MHz system bus for servers and workstations. The SATA Aberdeen Stirling X312 comes with 12 hot-swap drive bays, dual Gigabit LAN, 64 bit Raid controller and has space for an internal tape backup drive and a CD-RW drive. Housed in an ultra-dense 3U chassis and utilizing the Intel E7520 chipset, it guarantees the most diverse storage capacity in any 3U platform, and by design the Stirling X312 provides scalability for any enterprise looking for the ultimate storage and backup solution with the **XDAS scalable arrays**.

X312 SPEC SHEET

ABERDEEN STIRLING X312
3U RACKMOUNT BACKUP SERVER

MANUFACTURER PART#	SRVX312 **BLACK RACK**
ABERDEEN PART#	KITX312
PROCESSOR	Dual Socket 604 Dual Intel® Xeon™ Processors EM64T Support
CHIPSET	**Intel E7520 "Lindenhurst" chipset** **800 MHz FSB**
SYSTEM MEMORY	8 x 240-Pin DIMM Sockets **Up to 16GB DDR2-400 registered ECC** **Dual channel memory bus** **ECC Registerd DDR2 SDRAM ONLY** 2-way interleave provides outstanding memory performance (memory must be used in pairs)
ON BOARD I/O	1 x Floppy Connector 2 x Serial 16550 compatible ports 2 x USB 2.0 Ports PS/2 keyboard and mouse ports
ON BOARD IDE	Dual EIDE ports support Ultra DMA 100MB/s of Burst data transfer rate, supports UDMA Mode 5, PIO Mode 4 and ATAPI
VIDEO	ATI Rage XL 8MB PCI graphic controller
ON BOARD LAN	**Intel 82546GB Dual Gigabit controller** 2 x 10/100/1000 ports
SATA RAID	**1 x 3WARE Escalade 9500S 12-Port SATA150 RAID** SATA backplane provides power, bus termination **12 Hot-Swap/Hot-Spare SATA150 drive bays** StorSwitch™ non-blocking architecture for reliable, scalable, and high-performance hardware RAID isolation. **RAID 0, 1, 10, 5, and JBOD support** SCSI performance feature set
SCSI CONTROLLER	**LSI Logic 21320 Dual Channel Ultra320 SCSI card** External Wide SCSI connector (available connectors for internal or external SCSI tape drives)
SCALABLE SOLUTION	Connects to Aberdeen XDAS Direct Attached Storage Device **Connect up to 3 devices with SCSI port.**
PC HEALTH MONITORING	Onboard voltage monitors for CPU Fan status Environmental temperature monitor and control Chassis and CPU overheat alarm, LED indication and control System resource alert Supermicro System Management utility
BIOS	Phoenix 4Mb Flash ROM RTC (Real-Time Clock) wakeup External modem remote ring-on IF system is in Soft-Off state BIOS rescue hot keys rescue BIOS chip from flash failure Hardware BIOS virus protection Chipkill support
EXPANSION SLOTS	1 x (x8) PCI Express Slot **Total of 5 PCI-X** (1 x 64-bit PCI slot populated with 3Ware controller) (1 x 64-bit PCI slot populated with LSI SCSI controller) (3 x Empty 64-bit PCI-X Slots)
BOARD SIZE	Full ATX 12" x 13" in.(W x H)
EXPANSION BAYS	1 x 2.5" internal drive bay 1 x 5.25" slim external bay (cd-rom) 1 x 3.5" slim external (floppy) 16 x 3.5" x 1" drive bays
CHASSIS FEATURES	19" rackmount ATX (3U height/27" Depth) Heavy-duty cold-rolled steel with Zinc-plated interior Accepts Full Size Motherboard (12x13) **650W 2+1 Redundant Hot-Swap** 2 x 40MM Expansion Card Cooling Fans 3 x 80MM Hot Swap System Cooling Fans 2 x 60MM Rear Exhaust Fans Optimized HDD tray spacing to maximize air flow Buzzer alarm for fan failure and overheat warning
WARRANTY	1-year parts, 2-year labor warranty

X312 DISK PLACEMENT CHART

WARNING – The disk drive trays must be properly seated completely back into their sockets and they must be in their proper positions in order to avoid software corruption and/or hardware damage.

Please carefully read the following:

Your server has three rows of four hard disk drives. Each row is numbered from left to right. For safety during shipment to you, the drives have been removed and shipped separately.

The number stickers on the hard drive packages correspond to their placement in the chassis. Proper placement of the drives is critical in retaining the integrity of any software or operating system that has been loaded.

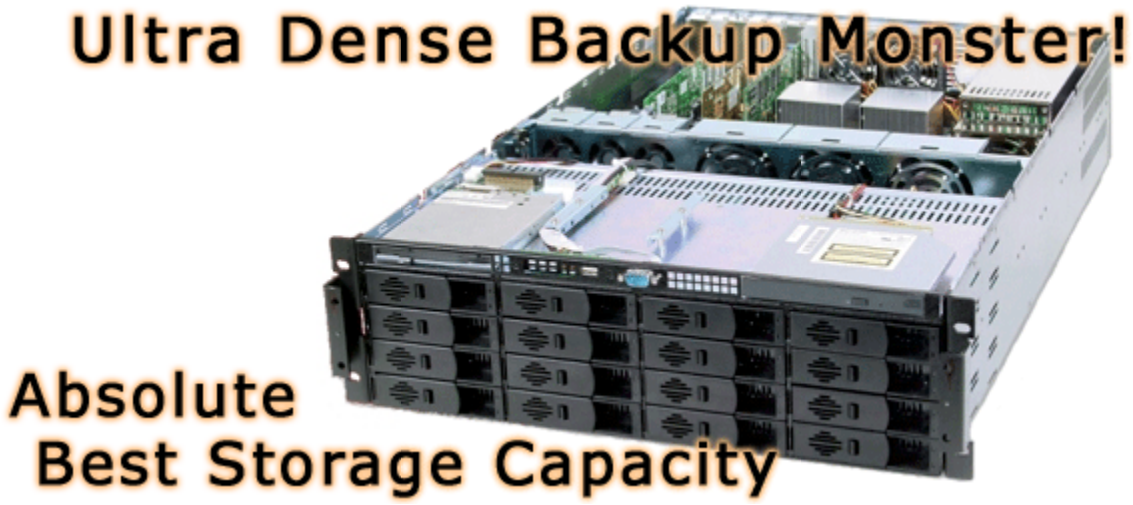
Slide the hard drive into place with the retaining handle extended. When the drive is fully inserted, push the retaining handle back until it is fully seated and snapped into the latch.

Should you require technical assistance with this or any other aspect of your Aberdeen server, contact us toll free at (800)552-6868 option 3 from 8:00am to 5:00pm PST.

APPENDIX - C

BACKUP MONSTER X316

ABERDEEN STIRLING X316



Stirling X316

dantz

Dantz Retrospect
Backup Software.

NAS AVAILABLE

INCOMPARABLE:
Aberdeen is proud to announce the improved capacity all inclusive With the release of the newest extension to the 3U SATA "Backup Monster" storage servers the Stirling X316 provides the absolute largest storage capacity in a 3U format. As an addition to our world famous line of Stirling Servers, this hot-swap 3U rackmount server that can store up to **over 6 Terabytes of data**. This "Backup Monster" is suited to be the perfect solution for the IT Manager looking to find a beefy storage solution at the most affordable price.

Our Ultra Dense "**Backup Monster**" costs as little as 1/10th the cost of a backup solution by any other company. This storage beast is capable of storing up to 6.4TB. This beast can be featured with SATA disk drives for those that require the most computing power possible. The **Aberdeen Stirling X316** now features the newly released Intel E7520 chipset (Lindenhurst) featuring PCI Express and DDR2 capability, Extended Memory 64 Technology (EM64T), and an 800MHz processor system bus to support the latest Intel Xeon (Nocona) dual processors with 1MB L2 cache and 800 MHz system bus for servers and workstations. The SATA Aberdeen Stirling X316 comes with 16 hot-swap drive bays, dual Gigabit LAN, 64 bit Raid controller and has a slim CD-ROM and floppy drive. Housed in an ultra-dense 3U chassis and utilizing the Intel E7520 chipset, it guarantees the absolute best storage capacity available in any 3U platform, and by design the Stirling X316 provides scalability for any enterprise looking for the ultimate storage and backup solution with the **XDAS scalable arrays**.

X316 SPEC SHEET

ABERDEEN STIRLING X316
3U RACKMOUNT BACKUP SERVER

MANUFACTURER PART#	SRVX316 **BLACK RACK**
ABERDEEN PART#	KITX316
PROCESSOR	Dual Socket 604 Dual Intel® Xeon™ Processors EM64T Support
CHIPSET	**Intel E7520 "Lindenhurst" chipset** **800 MHz FSB**
SYSTEM MEMORY	8 x 240-Pin DIMM Sockets **Up to 16GB DDR2-400 registered ECC** **Dual channel memory bus** **ECC Registerd DDR2 SDRAM ONLY** 2-way interleave provides outstanding memory performance (memory must be used in pairs)
ON BOARD I/O	1 x Floppy Connector 2 x Serial 16550 compatible ports 2 x USB 2.0 Ports PS/2 keyboard and mouse ports
ON BOARD IDE	Dual EIDE ports support Ultra DMA 100MB/s of Burst data transfer rate, supports UDMA Mode 5, PIO Mode 4 & ATAPI
VIDEO	ATI Rage XL 8MB PCI graphic controller
ON BOARD LAN	**Intel 82546GB Dual Gigabit controller** 2 x 10/100/1000 ports
SATA RAID	**2 x 3WARE Escalade 9500S 8-Port SATA150 RAID** SATA backplane provides power, bus termination **16 Hot-Swap/Hot-Spare SATA150 drive bays** StorSwitch™ non-blocking architecture for reliable, scalable, and high-performance hardware RAID isolation. **RAID 0, 1, 10, 5, and JBOD support** SCSI performance feature set
SCSI CONTROLLER	**LSI Logic 21320 Dual Channel Ultra320 SCSI card** External Wide SCSI connector (available connectors for internal or external SCSI tape drives)
SCALABLE SOLUTION	Connects to Aberdeen XDAS Direct Attached Storage Device **Connect up to 3 devices with SCSI port.**
PC HEALTH MONITORING	Onboard voltage monitors for CPU Fan status Environmental temperature monitor and control Chassis and CPU overheat alarm, LED indication and control System resource alert Supermicro System Management utility
BIOS	Phoenix 4Mb Flash ROM RTC (Real-Time Clock) wakeup External modem remote ring-on if system is in Soft-Off state BIOS rescue hot keys rescuing BIOS chip from flash failure Hardware BIOS virus protection Chipkill support
EXPANSION SLOTS	1 x (x8) PCI Express Slot **Total of 5 PCI-X** (2 x 64-bit PCI slots populated with 3Ware controllers) (1 x 64-bit PCI slot populated with LSI SCSI controller) (2 x Empty 64-bit PCI-X Slots)
BOARD SIZE	Full ATX 12" x 13" in.(W x H)
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WARRANTY	1-year parts, 2-year labor warranty

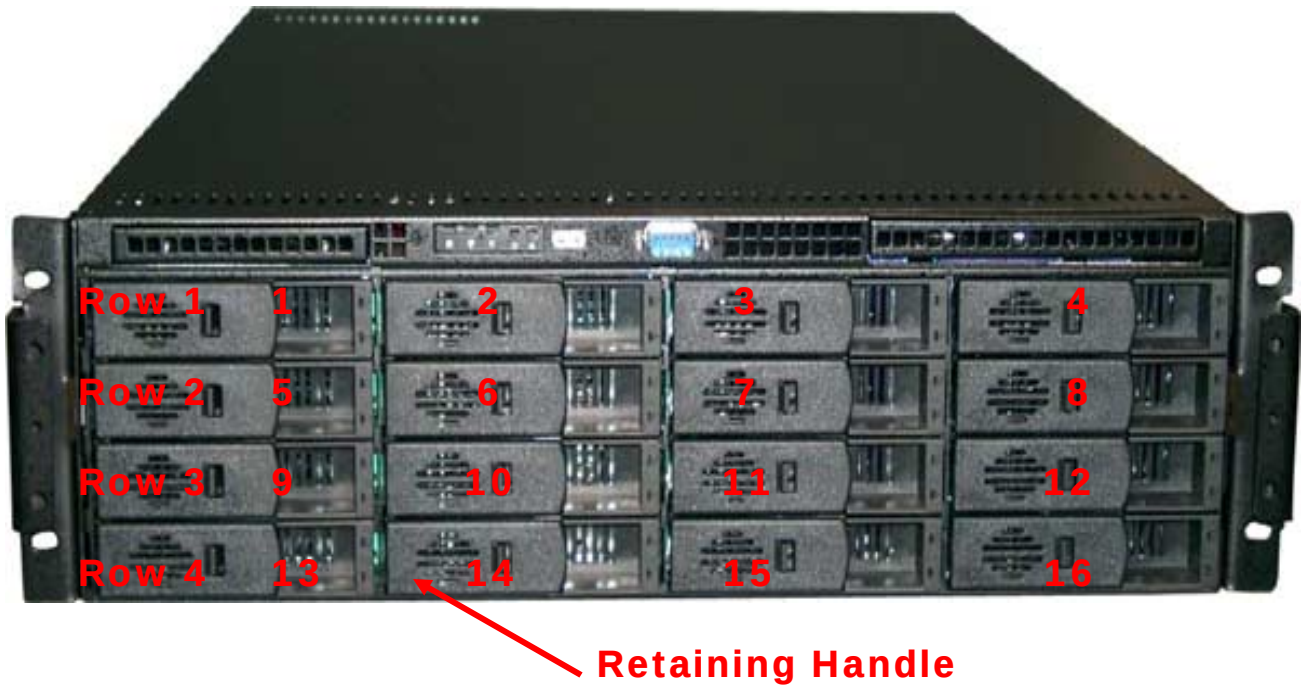
X316 DISK PLACEMENT CHART

WARNING – The disk drive trays must be properly seated completely back into their sockets and they must be in their proper positions in order to avoid software corruption and/or hardware damage.

Please carefully read the following:

Your server has four rows of four hard disk drives. Each row is numbered from left to right. For safety during shipment to you, the drives have been removed and shipped separately.

The number stickers on the hard drive packages correspond to their placement in the chassis. Proper placement of the drives is critical in retaining the integrity of any software or operating system that has been loaded.



Slide the hard drive into place with the retaining handle extended. When the drive is fully inserted, push the retaining handle back until it is fully seated and snapped into the latch.

Should you require technical assistance with this or any other aspect of your Aberdeen server, contact us toll free at (800)552-6868 option 3 from 8:00am to 5:00pm PST.

APPENDIX - D

TERABUSTER

ABERDEEN STIRLING X416

Stirling X416

Available with Dantz
Retrospect Backup Software.

Incomparable
We are proud to announce the newest addition to our revolutionary line of Stirling all-inclusive storage and backup servers, the Aberdeen Stirling "**TeraBuster.**" First Aberdeen created the "**Backup Monster**" with an amazing 2 Terabytes of backup storage capacity for under $5000. Based on our customers demands, we have pushed the proverbial envelope to offer an unparalleled 4 Terabytes of SATA storage space for under $12,000. As with the "Backup Monster," the "TeraBuster" integrates Dantz Development's Retrospect™ backup software and be configured with dual Intel® Xeon™ processors for those that require the most computing power possible. Businesses can now safely guard against downtime and the loss of critical data with the Stirling line of backup servers.

The Aberdeen "TeraBuster" establishes a new standard for the server storage market by offering a 4U rackmount server with up to 4 Terabytes of SATA hot-swap storage space. Every Stirling "TeraBuster" backup server includes; 16 hot-swap/hot-spare drive bays, dual gigabit NICs, an internal wall of cooling fans and support for RAID 0,1,5 & 10. Options include; a tape drive, two internal OS hard drives, CD-RW, a triple redundant 600W power supply and Dantz Development's Retrospect™ backup software to provide data security, disaster recovery and file storage capabilities.

X416 SPEC SHEET

MANUFACTURER PART#	BBX416 **BLACK RACK**
ABERDEEN PART#	KITX416
PROCESSOR	Dual Socket 604 **Supports Dual Intel® Xeon processors** Front-Side Bus support for 533MHz or 400MHz Onboard 3-phase switching power regulator
CHIPSET	**Intel E7501 Server chipset**
SYSTEM MEMORY	8 x 184-Pin DIMM Sockets **Up to 16GB ECC Registered DDR266 SDRAM** Compatible with PC2100 and PC1600 **ECC Registerd DDR SDRAM ONLY** Two-way interleaved memory banks provide outstanding memory performance.
ON BOARD I/O	1 x Floppy Connector 2 x Serial 16550 compatible ports 2 x USB 1.1 Ports PS/2 keyboard and mouse ports
ON BOARD IDE	Dual EIDE ports support Ultra DMA 100MB/s of Burst data transfer rate, supports UDMA Mode 5, PIO Mode 4 and ATAPI
VIDEO	ATI Rage XL 8MB PCI graphic controller
ON BOARD LAN	**Dual Gigabit with Intel 82546EB Controller** 2 x 10/100/1000 ports
SATA RAID	**2 x 3WARE Escalade 8506 8-Port SATA150 RAID** SATA backplane provides power, bus termination **16 Hot-Swap/Hot-Spare SATA150 drive bays** StorSwitch™ non-blocking architecture for reliable, scalable, and high-performance hardware RAID isolation. **RAID 0, 1, 10, 5, and JBOD support** SCSI performance feature set
PC HEALTH MONITORING	Onboard voltage monitors for CPU Fan status Environmental temperature monitor and control Chassis and CPU overheat alarm, LED indication and control System resource alert Supermicro System Management utility
BIOS	Phoenix 4Mb Flash ROM RTC (Real-Time Clock) wakeup External modem remote ring-on when system is in Soft-Off state BIOS rescue hot keys for rescuing BIOS chip from flash failure Hardware BIOS virus protection Chipkill support
EXPANSION SLOTS	3 x 64-bit 100MHz PCI-X 1 x 64-bit 66MHz PCI (2 x 64-bit PCI slots populated with 3Ware controllers) 1 x VXB (Virtual Extended Bus)
BOARD SIZE	Full ATX 12" x 13" in.(W x H)
EXPANSION BAYS	1 x 3.5" external drive bay 1 x 3.5" internal drive bay 1 x 5.25" external drive bay **1 x 5.25" slim drive bay***new feature* 16 x 3.5" x 1" drive bays
CHASSIS FEATURES	19" rackmount ATX (4U height) - RM414 24" Depth, Accepts Full Size Motherboard (12x13) **650W Triple Redundant Hot-Swap** 5 x 8cm easy swap cooling fans Optimized HDD interspace to maximize inlet air flow Buzzer alarm for fan failure and overheat warning

Includes 1 x 3.5" floppy drive
Slim CD-Rom Drive
Rackmount Rails

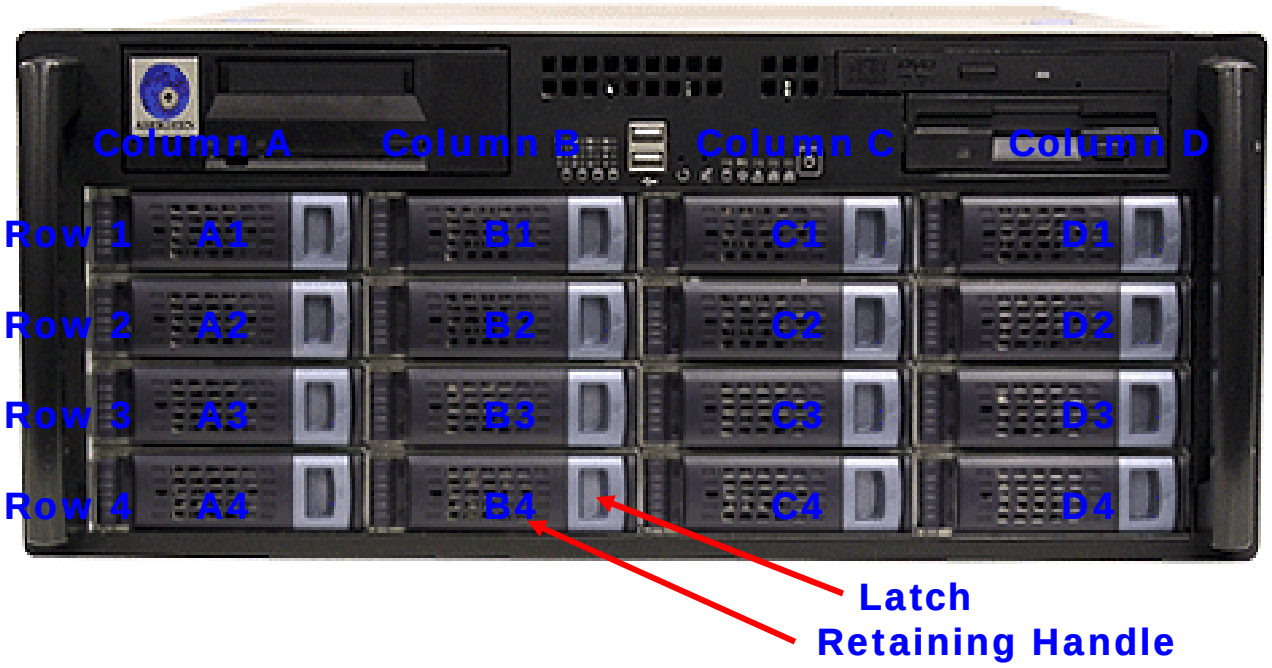
X416 DISK PLACEMENT CHART

WARNING – The disk drive trays must be properly seated completely back into their sockets and they must be in their proper positions in order to avoid software corruption and/or hardware damage.

Please carefully read the following:

Your TeraBuster has four columns of four hard disk drives. The columns are labeled alphabetically from left to right and the rows are numbered from top to bottom. For safety during shipment to you, the drives have been removed and shipped separately.

The number stickers on the hard drive packages correspond to their placement in the chassis. Proper placement of the drives is critical in retaining the integrity of any software or operating system that has been loaded.



Slide the hard drive into place with the retaining handle extended. When the drive is fully inserted, push the retaining handle back until it is fully seated and snapped into the latch.

Should you require technical assistance with this or any other aspect of your Aberdeen server, contact us toll free at (800)552-6868 option 3 from 8:00am to 5:00pm PST.

APPENDIX - E

TERASTORUS

ABERDEEN STIRLING X524

Incomparable
The newest addition to the all-inclusive Aberdeen Stirling storage backup server line is here. Dubbed the "**TeraStorus**" the Aberdeen Stirling X524 can provide up to 6TB of pure storage.

Stirling X524

Aberdeen revolutionized the backup storage community with the 2TB "**Backup Monster**" for under $5000. Just a few months later the 4TB "**TeraBuster**" was launched with double the capacity. That was then and the future is now. The TeraStorus is the goliath of backup storage servers with 24 hot-swap hard disk drive bays suitable for 6TB of pure data storage capacity.

As with the previous backup Stirling storage servers, the "TeraStorus" integrates Dantz Development's Retrospect™ backup software and be configured with dual Intel® Xeon™ processors for those that require the most computing power possible. Businesses can now safely guard against downtime and the loss of critical data with the Stirling line of backup servers.

The Aberdeen "TeraStorus" redefines the standard for the backup server storage market by offering a 5U rackmount server with up to 6 terabytes of SATA hot-swap storage space starting under $14,000. Every Stirling "TeraStorus" backup server includes; room for dual internal OS hard drives, internal 24 hot-swap/hot-spare drive bays, dual gigabit NICs, support for RAID 0,1,5 & 10, an internal wall of cooling fans and an external SCSI port for expansion up to 21TB through the addition of up to five 3TB RAID storage expansion boxes per SCSI connector, thus creating a **scalable NAS server**. Options include; a tape drive, CD-RW, a 3+1 redundant 950W power supply and Dantz Development's Retrospect™ backup software to provide data security, disaster recovery and file storage capabilities.

A 10 terabyte storage capacity TeraStorus backup server will be available in Q2 2004 by utilizing the newest 400GB SATA hard drives.

Available with Dantz
Retrospect Backup Software.

X524 SPEC SHEET

MANUFACTURER PART#	BBX524 **BLACK RACK**
ABERDEEN PART#	KITX524
PROCESSOR	Dual Socket 604 **Supports Dual Intel® Xeon processors** Front-Side Bus support for 533MHz or 400MHz Onboard 3-phase switching power regulator
CHIPSET	**Intel E7501 Server chipset**
SYSTEM MEMORY	8 x 184-Pin DIMM Sockets **Up to 16GB ECC Registered DDR266 SDRAM** Compatible with PC2100 and PC1600 **ECC Registerd DDR SDRAM ONLY** Two-way interleaved memory banks provide outstanding memory performance.
ON BOARD I/O	1 x Floppy Connector 2 x Serial 16550 compatible ports 2 x USB 1.1 Ports PS/2 keyboard and mouse ports
ON BOARD IDE	Dual EIDE ports support Ultra DMA 100MB/s of Burst data transfer rate, supports UDMA Mode 5, PIO Mode 4 and ATAPI
VIDEO	ATI Rage XL 8MB PCI graphic controller
ON BOARD LAN	**Intel 82546EB Dual Gigabit controller** 2 x 10/100/1000 ports
ON BOARD SCSI	**Dual channel Adaptec® AIC-7902 controller Ultra320 SCSI** External Bracket w/ Wide SCSI connector (available connectors for internal or external SCSI tape drives)
OS DRIVE MIRROR	For added system safety and system failover Fixed internal IDE drives
SATA RAID	**3 x 3WARE Escalade 8506 8-Port SATA150 RAID** SATA backplane provides power, bus termination **24 Hot-Swap/Hot-Spare SATA150 drive bays** StorSwitch™ non-blocking architecture for reliable, scalable, and high-performance hardware RAID isolation. **RAID 0, 1, 10, 5, and JBOD support** SCSI performance feature set
PC HEALTH MONITORING	Onboard voltage monitors for CPU Fan status Environmental temp monitor and control Chassis and CPU overheat alarm, LED indication and control System resource alert Supermicro System Management utility
BIOS	Phoenix 4Mb Flash ROM RTC (Real-Time Clock) wakeup External modem remote ring-on when system is in Soft-Off state BIOS rescue hot keys for rescuing BIOS chip from flash failure Hardware BIOS virus protection Chipkill support
EXPANSION SLOTS	**Total of 6 PCI-X** (3 x 64-bit PCI slots populated w/3Ware controllers) (3 x Empty 64-bit PCI-X Slots) 1 x VXB (Virtual Extended Bus)
BOARD SIZE	Full ATX 12" x 13" in.(W x H)
EXPANSION BAYS	1 x 3.5" external drive bay / 2 x 3.5" internal drive bay 1 x 5.25" external drive bay 1 x 5.25" slim drive bay / 24 x 3.5" x 1" drive bays
CHASSIS FEATURES	19" rackmount ATX (5U height) - RMC5E 25.4" Depth, Accepts Full Size Motherboard (12x13) **950W 3+1 Triple Redundant Hot-Swap** 2 x 12cm Hot-Swap Blowers 2 x 60x38mm Fans Exhaust Fans Optimized HDD interspace to maximize inlet air flow Buzzer alarm for fan failure and overheat warning

Includes 1 x 3.5" floppy drive
Slim CD-ROM Drive
Rackmount Rails

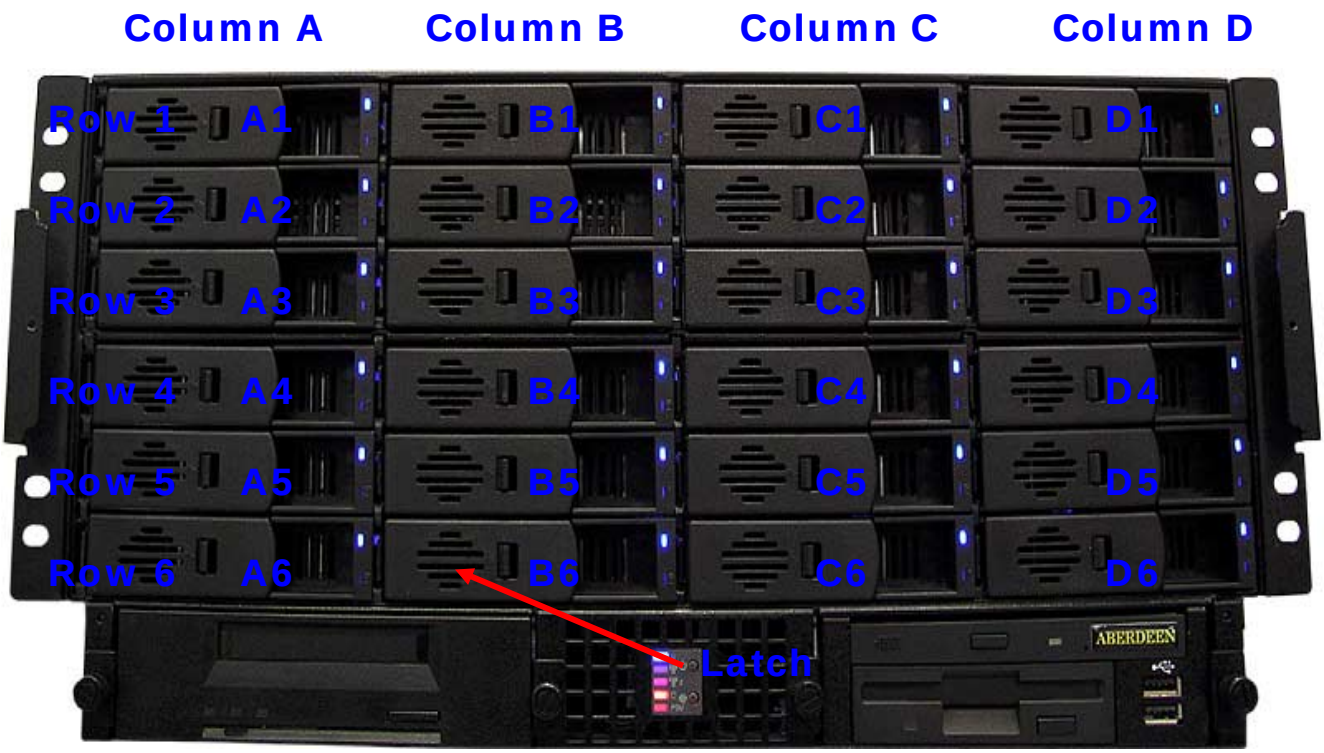
X524 DISK PLACEMENT CHART

WARNING – The disk drive trays must be properly seated completely back into their sockets and they must be in their proper positions in order to avoid software corruption and/or hardware damage.

Please carefully read the following:

Your TeraStorus has four columns of six hard disk drives. The columns are labeled alphabetically from left to right and the rows are numbered from top to bottom. For safety during shipment to you, the drives have been removed and shipped separately.

The number stickers on the hard drive packages correspond to their placement in the chassis. Proper placement of the drives is critical in retaining the integrity of any software or operating system that has been loaded.



Slide the hard drive into place with the retaining handle extended. When the drive is fully inserted, push the retaining handle back until it is fully seated and snapped into the latch.

Should you require technical assistance with this or any other aspect of your Aberdeen server, contact us toll free at (800)552-6868 option 3 from 8:00am to 5:00pm PST.

APPENDIX - F

3WARE ESCALADE CONTROLLER

3DM

DISK MANAGEMENT UTILITY

Introduction:
The 3DM disk management utility allows you to view status and version information pertaining to your Escalade ATA RAID Controller. 3DM alerts you when a disk array needs maintenance, and you can maintain your disk arrays from 3DM. You can add or remove drives, specify an available drive as a hot spare or launch the rebuild process. Array status can be viewed or arrays can be maintained remotely via a standard web browser provided you have access to the network containing the Escalade ATA RAID Controller.

Event notification occurs from 3DM when the ATA RAID controller requires attention, such as when a disk array becomes degraded and is no longer fault tolerant. Event notification will only occur while 3DM is running, so we recommend that 3DM be left running as a background utility on the ATA RAID controller's machine. The event notification e-mail feature can send an e-mail to a specified recipient when 3DM detects a problem within the array. The e-mail received will include most of the information provided in the Logs on the Alarms page.

Documentation:
The online manual and user guide is available to download on the Aberdeen Website. http://www.aberdeeninc.com/abcatg/Aberdeen-AberNAS-3ware.pdf

Troubleshooting:
Common usage concerns with the 3DM Utility and the 3Ware Escalade controller.

Soft Reset - A "Soft Reset" message window will appear on the desktop upon each restart of the system. This is normal for the 3DM software as it treats each restart of the system as a reported incident.

Power Status Lights – Each unit includes hard disk drive power status LEDs.

Hot Swap - With 3Ware, "activity" is the key word. Soft Reset will notify that the system is being shut down and re-starting.

Error Reporting – There is no error reported when a drive is removed while the system is powered up and inactive. 3Ware management software will immediately report a drive missing or defective when there is read or write activity addressed to that drive. The constant polling of the drives was deemed by 3Ware to be a performance degrading overhead activity and unnecessary.

RAID Control - The mirroring of the operating system drives is controlled by the Microsoft software and not by the 3Ware controller.

AMCC STORAGE

User Guide

3ware®

Serial ATA RAID Controller

Supports the 9000 Series

PN 720-0104-00
April, 2004

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Disclaimer

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3ware Disk Manager (3DM 2)

Note: 3DM 2 includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).

3ware Disk Manager 2 (3DM 2), allows you to view the status of and manage 3ware RAID controllers and associated drives. 3DM runs as a service under Microsoft Windows, and as a daemon under Linux. When it is running, you can use your browser to view status and perform administrative tasks locally or remotely.

3DM 2 can display information about 3ware RAID 7000-, 8000- and 9000-series RAID controllers. However, some version 2 features are only available for 9000-series controllers.

Two levels of access are provided: user and administrator. Users have view-only access—they can check the status of drives and units—while Administrators can view and make changes, using 3DM to configure RAID units and designate hot spares, and to perform maintenance tasks on RAID units.

In this section, information about 3DM is organized into the following topics:

- "Browser Requirements for 3DM" on page 28
- "Installing 3DM" on page 29
- "Starting 3DM and Logging In" on page 35
- "Working with the 3DM Screens" on page 37
- "Setting Up 3DM Preferences" on page 41
- "Running Two Versions of 3DM" on page 44
- "3DM 2 Reference" on page 45

"3DM 2 Reference"contains information about the fields and settings on each page in 3DM. For additional information about doing particular tasks in 3DM, see the remaining sections in this guide.

Browser Requirements for 3DM

3DM runs in most current web browsers. Tested and supported browsers include:

- Mozilla 1.2 and above
- Internet Explorer 5.5 and above

Additional requirements:

- JavaScript must be enabled
- Cookies must be enabled
- For best viewing, use a screen resolution of 1024 X 768 or greater, and set colors to 16 bit color or greater.

Note: Because 3DM may be viewed in different browsers, the format and style of the 3DM browser windows illustrated in this chapter are examples only. (Screenshots were taken in Internet Explorer.) The actual "look" of the windows will depend on the browser, 3DM version and operating system in use.

Setting up Mozilla

Details about accessing all ports, including port 888, by adding a list of ports to /Mozilla/default/all.js

Note: For security reasons, some web browsers do not allow connections to certain ports including port-1080 and 888. To override this on a per-port basis, the Mozilla release notes recommend to add a comma-separated list of ports to default/all.js (in your Mozilla installation directory). For example, to unblock port 888, use the following line:

pref("network.security.ports.banned.override", "888")

This file is located at:

`/usr/lib/mozilla/defaults/pref/all.js`

Installing 3DM

3DM 2 can be installed from the main 3ware CD that came with your 3ware RAID controller. You can also download the current version from the website at http://www.3ware.com/support/download.asp.

3DM must be installed on the system in which the controller is installed. 3DM does not have to be installed on remote systems in order to remotely manage a 3ware controller.

During installation, you will be asked to enter the following preferences for 3DM use. (Each of these preferences can be changed later, from within 3DM.)

- The HTTP port to be used as the listening port
- Whether remote access will be allowed
- Whether you want email alerts to be sent when errors occur, and who should receive them

Installing 3DM on a Windows system

The 3ware RAID controller works with Windows 2000, Windows XP, and Windows Server 2003. The latest service packs should be installed for any Windows release.

To install 3DM on a Windows system

1 Insert the 3DM CD-ROM and click **Install 3DM 2** when the menu appears.

Or, if you downloaded 3DM from the website, find the file 3DM2_x86.exe or 3DM2_AMD64.exe and double-click it to launch the setup.

2 If a command window opens, press any key to begin the installation process.

3 When the License Agreement screen appears, read and agree to the license information; then let the InstallShield Wizard guide you through the installation process.

4 On the **3DM Remote Monitoring and Security Configuration** screen (see Figure 10), use the settings to specify these things:

- To change the HTTP port that 3DM will use as a listening port, check the first box.

  If you do not know which port to use, leave the box unchecked and use the default port.

- To allow remote administration, uncheck the second checkbox.

When the second checkbox is checked, only localhost connections are allowed. Internet and Intranet connections are not allowed.

(You can change this setting later in 3DM.)

3ware 3DM 2 Setup
3DM 2 Remote Monitoring and Security Configuration.
3ware
Check first box to update 3DM 2 HTTP listening port.
Uncheck second box to allow Internet/Intranet connections to 3DM 2
Change 3DM 2 port. [Currently:888]
Restrict to localhost only connections.
InstallShield
< Back
Next >
Cancel

Figure 10. 3DM Remote Monitoring and Security Configuration Display

5 If the **3DM HTTP listening port setup** screen appears, enter the HTTP port you want to use.

This screen only appears when you check the first box on the **3DM Remote Monitoring and Security Configuration** screen.

(You can change this setting later within 3DM.)

6 On the **E-mail Notification Preferences** screen (see Figure 11) use the fields to specify initial email settings.

Note: If you do not want email alerts to be sent to anyone, leave "None" in these fields and click **Next** to go on to the next screen.

- In the **Server** field, enter the name of your email server.

  If you do not know your server name, ask your system administrator or check the e-mail preferences or setup options on your e-mail client.

- In the **Recipients** field, enter the e-mail address of the user who should receive the 3DM e-mail status messages.

  You may enter multiple e-mail addresses, separating each entry with a comma (,).

- In the **Sender** field, enter the email address from which the email notifications will be sent. This is typically the local host name.

(You can change these settings later within 3DM.)

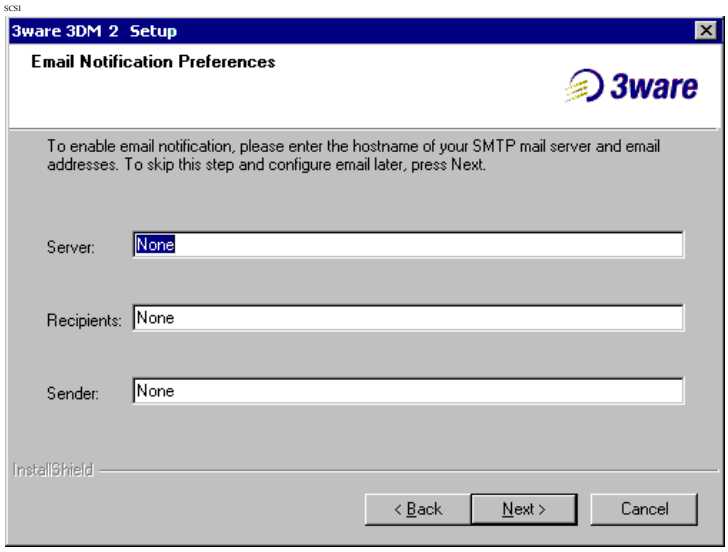

Figure 11. 3DM E-mail Notification Preferences

7 Continue with the installation as prompted, clicking **Next** to move to the next screen, and **Finish** when you reach the last screen.

3DM Installation gives you the option of starting 3DM and opening the browser window.

8 If you elect to launch the web interface, a Security Alert may appear, as shown in Figure 12. Click **Yes** continue.

You may install the certificate if you do not want to see this alert in the future. To do so, click View Certificate and then click Install Certificate.

Security Alert
Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate.
The security certificate was issued by a company you have not chosen to trust. View the certificate to determine whether you want to trust the certifying authority.
The security certificate date is valid.
The name on the security certificate is invalid or does not match the name of the site
Do you want to proceed?
Yes
No
View Certificate

Figure 12. Security Alert dialog box

9 When the first 3DM screen appears in your browser, log in as Administrator and use the default password, `3ware`.

Notes:
You can start 3DM later by choosing **3DM** from the **Start** menu.

If you change, add, or remove an IP address, or change the machine name of the machine on which you have installed 3DM 2, you will need to recreate the security certificate. You can do so by re-installing 3DM 2, or by deleting the file 3dm2.pem and restarting the 3DM 2 service. Under Windows, this file is located in the same directory in which you installed 3DM 2. Under Linux, the file resides in /etc/3dm2. You may also want to delete the installed/cached security certificate from your browser.

Uninstalling 3DM under Microsoft Windows

Use the Add or Remove Programs control panel to uninstall 3DM.

- From the **Startup** menu, choose **Control Panels > Add or Remove Programs**.
- In the Add or Remove Programs control panel, select **3DM** and click **Change/Remove**.

Installing 3DM for Linux or FreeBSD

You can install 3DM from the command line, or from a GUI. The steps below describe how to install 3DM from the command line. If you are using a GUI, you can access the CD-ROM and folders from the windows in the GUI.

Note: If you downloaded 3DM_Linux.zip from the website, unzip the file to root (or to any other working directory) and change Directory (CD) to that directory (for example: `/root`). Then start the following procedure at step 3, substituting `/mnt` with `/root` or your installation directory.

To start the installation

1 Insert the 3ware software installation CD-ROM for Linux into the CD-ROM drive.

2 Mount the CD-ROM disk:

```
mount /dev/cdrom /mnt
```

3 Change the directory and run the install script:

For Linux:

```
cd /mnt/packages/3dm2/linux/x86
./install.3dm
```

For FreeBSD:

```
cd /mnt/packages/3dm2/freebsd/x86
./install.3dm
```

To specify initial setup for 3DM 2

During installation, you will be prompted with a series of questions that determine initial 3DM settings. You can change these later, from within 3DM.

(The first question appears for Linux, but not for FreeBSD.)

1 `Was RPM used to install the Escalade driver and/or 3DM?`

The default answer is no.

2 `Please enter the location of the help documentation (default is /usr/local/doc/3dm)`

Press Enter to accept the default location and display the next question, or enter the path at which you want the documentation to be installed.

3 `Would you like to have e-mail notification enabled (Y/N)?`

E-mail notification sends an email message when an event occurs.

The default answer to this question is “yes”.

If you enable e-mail notification you will be asked to provide additional information: the name of the mail server, the user name for the person who will send the E-mail notification (typically the local host name) and the user name for the person who will receive the e-mail notification (typically the system administrator).

```
Please enter the name of your mail server: (default is local
host name)
Please enter the name of the user you want sending e-mail
notification: (default is root)
Please enter the name of the user you want receiving e-mail
notification: (default is 3ware_admin)
```

To enter multiple e-mail addresses, separate them by a comma or a semicolon:

4 `Please enter the port number you would like to use for web monitoring (default is 888)`

If you do not know what port to use, select the default:

5 `Would you like 3DM connection security to limit connections to localhost only? (default is yes)`

If you want to be able to use 3DM for remote administration, change this to No.

6 Change the directory and then eject the CD-ROM disk when finished:

```
cd /home
eject cdrom
```

Uninstalling 3DM under Linux or FreeBSD

To uninstall 3DM for Linux or FreeBSD

1 Insert the 3ware software installation CD-ROM into the CD-ROM drive.

2 Mount the CD-ROM disk:

```
mount /dev/cdrom /mnt
```

3 Change the directory and run the uninstall script:

(For FreeBSD, replace “linux” with “freebsd” in the path shown in this step.)

```
cd /mnt/packages/3dm2/linux/x86
./install.3dm --u
```

Note that if you downloaded 3DM from the web, replace “/mnt/” in the previous command with “/root/”

4 Eject the CD-ROM disk when finished:

```
cd /home
eject cdrom
```

Note: If 3DM Linux is reinstalled or restarted, close any open web browsers before starting 3DM again to close the server socket.

Starting 3DM and Logging In

3DM runs as a service under Windows, and as a daemon under Linux.

It is a good idea to leave 3DM running on the system that contains your 3ware RAID controller. That way email alerts can be sent by 3DM, and administrators can manage the controller remotely, if remote administration is enabled.

You can access the 3DM screens to check status information and manage your 3ware RAID controller by logging in to the 3DM screens in your browser.

Starting 3DM under Linux

3DM should start automatically after installation and upon bootup.

To start 3DM manually

1 Login as root.

1 Afterwards, type:

For Red Hat Linux:

```
/etc/rc.d/init.d/3dm start
```

For SuSE Linux:

```
/etc/rc.d/3dm start
```

2 Open your browser and enter the URL for your system.

The default URL is https://localhost:888/.

You can also replace “localhost” with the IP address of the computer that contains the 3ware controller. For example: https://<IP address>:888/

The 3DM login screen appears.

Starting 3DM under Windows

■ From the Start menu, choose **Programs > 3ware > 3DM 2.**

Your default browser opens and displays the URL for your local controller.

The default URL is https://localhost:888/.

You can also replace “localhost” with the IP address of the computer that contains the 3ware controller. For example:

https://<IP address>:888/

Note: If you close your browser, 3DM continues to run in the background on the system.

Viewing 3DM Remotely via a Standard Web Browser

When remote administration is enabled, you can use 3DM to check status and administer your 3ware RAID controller from a browser on any computer, over an internet connection.

You do not need to install the 3DM software on the remote computer.

Remote connections can be enabled or disabled from the 3DM Settings page.

- In the address line of your browser, enter the URL or IP of the system containing the 3ware RAID controller.

  If you don't know the URL or IP for the system, you can contact your network administrator or from a Windows command prompt, type `ipconfig`. From a Linux command prompt, type `ifconfig`.

Logging In

When you first view 3DM in a browser, you must log in before you can view or change any information.

Two levels of access are provided:

- Users can check the status of the controller, units, and drives attached to it.
- Administrators can check status, configure, and maintain the equipment.

(Administrator and User status in 3DM is not related to Administrator/User settings in the operating system.)

To log in to 3DM

1 On the 3DM logon screen, select whether you are a **User** or **Administrator**.

2 Enter your password and click **Login**.

  If you are logging in for the first time after installing 3DM, the default password for both User and Administrator is `3ware`.

Note: If you forget the passwords, uninstalling and reinstalling 3DM resets the passwords to `3ware`.

Working with the 3DM Screens

3DM's features are organized on a series of pages you view in your browser.

After you log in to 3DM, the Summary page shows a list of controllers installed in the computer at the URL you specified.

Note: If you expect to see a controller that is not listed, it may not be compatible with the driver that is loaded; a firmware flash upgrade may be required.

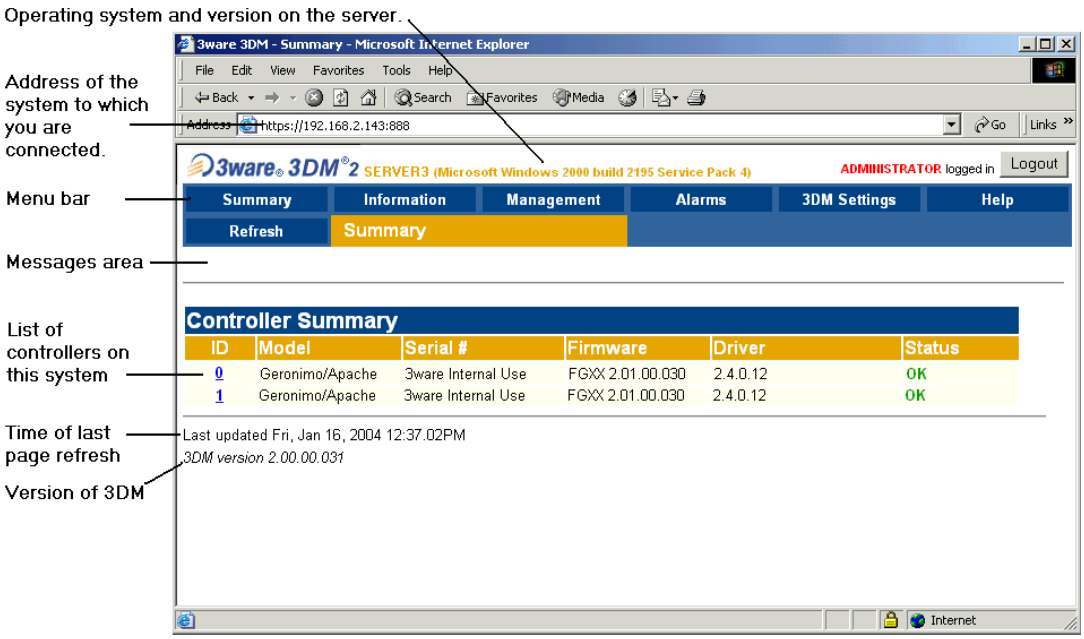
Operating system and version on the server.
Address of the system to which you are connected.
Menu bar
Messages area
List of controllers on this system
Time of last page refresh
Version of 3DM
3ware 3DM - Summary - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://192.168.2.143:888
Go Links
3ware 3DM 2 SERVER3 (Microsoft Windows 2000 build 2195 Service Pack 4)
ADMINISTRATOR logged in
Logout
Summary Information Management Alarms 3DM Settings Help
Refresh
Summary
Controller Summary
ID Model Serial # Firmware Driver Status
0 Geronimo/Apache 3ware Internal Use FGXX 2.01.00.030 2.4.0.12 OK
1 Geronimo/Apache 3ware Internal Use FGXX 2.01.00.030 2.4.0.12 OK
Last updated Fri, Jan 16, 2004 12:37:02PM
3DM version 2.00.00.031
Internet

Figure 13. 3DM Main Screen

The menu bar across the top of the screen gives you access to other pages in 3DM. You can move between pages by using the menu bar, or by clicking a link on the page.

The main area of the page provides summary or detail information about your 3ware RAID controller and the resources connected to it.

As you work in 3DM, the Messages area just below the menu bar displays information about the results of commands you have selected.

3DM Menus

The 3DM menu bar groups access to a number of 3DM pages on menus, and provides direct link access to others.

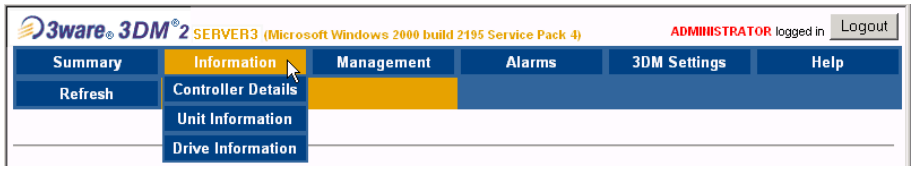

Figure 14. 3DM Menu Bar

Status information is available from the **Information menu**. You can view controller, unit, and drive information for a particular controller.

The **Management menu** gives you access to tasks used for managing controller-level settings (background task rate, enabling of unit write cache, and policies that affect all units managed by the controller), tasks that can be scheduled (rebuild, verify, and self-test), and maintenance of individual units. Unit configuration can also be done through the Management > Maintenance page.

The **Alarms** page shows a list of alarms, including the specific alarm message, and the exact date and time it occurred.

The **3DM Settings** page lets you set preferences, including email notification for alarms, passwords, page refresh frequency, whether remote access is permitted, and the incoming port which 3DM will use for listening.

Help lets you access information about using 3DM, and provides access to an electronic copy of this User Guide.

Viewing Information About Different Controllers in 3DM

If you have more than one controller in the system, you select the one you want to see details about from the drop-down list at the right of the menu bar.

This drop-down is available on all pages that provide controller-specific features.

Note: Throughout these instructions, *current controller* is used to refer to the controller which is currently selected in this drop-down list.

Refreshing the Screen

You can refresh the data on the screen at any time by clicking **Refresh Page** in the menu bar. This causes 3DM to update the information shown with current information from the controller and associated drives.

Automatic refreshes can also be set. For details, see "Setting the Frequency of Page Refreshes" on page 43.

Note: If you click Refresh on the browser window, you will be taken back to the Summary page.

3DM Screens and What They're Used For

Table 5 shows a list of the pages you work with in 3DM and describes what they are used for. Details about each page and the fields and features on it are provided in the section "3DM 2 Reference" on page 45. The page names in Table 5 provide links to details about that page.

Table 5: List of 3DM Pages

3DM Page	Description
Controller Summary Page	Provides basic information about each 3ware RAID controller in your system. To see this page, click Summary in the menu bar.
Controller Details Page	Provides detailed information about the current controller. To see this page, choose **Information > Controller Details** from the menu bar.

Table 5: List of 3DM Pages

3DM Page	Description
Unit Information Page	Shows a list of the units on the current controller and provides summary information about each unit. To see this page, choose **Information > Unit Information** from the menu bar or click an ID number on the Controller Summary.
Unit Details Page	Shows details about a particular unit. To see this page, click an ID number on the Unit Information page.
Drive Information Page	Shows a list of drives on the current controller and provides summary information about each drive. To see this page, choose **Information > Drive Information** from the menu bar.
SMART Details About Drive at Particular Port Page	Shows the SMART data for a specific drive. To see this page, click the Port # for a drive on the Drive Information page.
Controller Settings Page	Lets you view and change settings that affect the units on the current controller. To see this page, choose **Management > Controller Settings** from the menu bar.
Scheduling Page	Lets you view and change the schedule for tasks that affect all units on the current controller. To see this page, choose **Management > Scheduling** from the menu bar.
Maintenance Page	Lets you configure new units and make changes to existing units. To view this page, choose **Management > Maintenance** from the menu bar.
Alarms Page	Shows a list of alarms, including the specific alarm message, and the exact date and time it occurred. To view this page, click **Alarms** on the menu bar.
3DM Settings Page	Lets you set preferences, including email notification for alarms, passwords, page refresh frequency, whether remote access is permitted, and the incoming port which 3DM will use for listening. To view this page, click **3DM Settings** on the menu bar.

Setting Up 3DM Preferences

The 3DM Settings page lets you define preference settings that affect the overall operation of 3DM. Most of these settings are specified initially during installation of 3DM.

On the 3DM Settings page you can perform the following tasks:

- Setting and Changing 3DM Passwords
- Managing E-mail Event Notification
- Enabling and Disabling Remote Access
- Setting the Incoming Port #
- Setting the Frequency of Page Refreshes

Setting and Changing 3DM Passwords

3DM provides different access levels for users and administrators.

The Administrator access level allows the user to fully configure 3DM. The User access level allows the user to view pages within 3DM. These passwords work independently of each other.

The default password for both the User and Administrator is “3ware”.

Passwords are case sensitive.

You can only change passwords if you are logged in as Administrator. If you change the Administrator password, you will be automatically logged out, and must log back in with the new password.

To set or change the password

1 Click **3DM Settings** on the 3DM menu bar.

2 On the 3DM Settings page, in the **Password** section, select the type of password you want to change: **User** or **Administrator**.

3 Type the current password in the **Current Password** field.

If you are changing the password for the first time, the factory-set default password is `3ware`.

4 Enter the new password in the **New Password** field and again in the **Confirm New Password** field.

5 Click the **Change Password** button to enact the change.

Note: If you forget your password, you can uninstall 3DM and then reinstall it. This will reset the password to the default password, 3ware.

Managing E-mail Event Notification

3DM can notify you when the 3ware RAID controller requires attention, such as when a disk unit becomes degraded and is no longer fault tolerant.

Event notification can only occur while 3DM is running, so it is recommended that 3DM be left running on the system that contains the 3ware RAID controller.

When events occur, notification can be e-mailed to one or more recipients. You can specify the type of events for which notifications will be sent by selecting the severity:

- **Information** will send e-mails for all alarms
- **Warning** will send e-mail for alarms with severity of Warning and Error only.
- **Error** will send e-mail for alarms with severity of Error only.

For more information about events and alarms, see "Viewing Alarms" on page 107.

Event notification is initially set up during 3DM installation, but can be changed on the 3DM Settings page.

To set up event notification

1 Click **3DM Settings** on the menu bar.

2 In the **E-mail Notification** section of the 3DM Settings page, enter or change the settings you want.

- Enable or Disable all notifications.
- Set the severity level of events for which e-mail notifications are sent.
- Specify the email address of the sender. This will appear in the "From" field of the e-mail.
- Enter the e-mail address(es) to which notifications are sent. (Separate multiple addresses with a comma (,) or a semicolon (;).
- Enter the SMTP server name or IP of your mail server.

3 Click **Save E-mail Settings**.

To send a test message

You can send a test message to make sure you've entered the e-mail notification settings correctly.

- Click **Send Test Message.**

Enabling and Disabling Remote Access

When remote access is enabled, a user can connect to 3DM over the internet or an intranet, to check status or administer the controller and associated drives.

If remote access is disabled and a user attempts to connect to 3DM remotely, they will see the following error message: “Remote Access to 3DM has been disabled. Please connect using the local machine by entering “localhost” in the URL bar.”

Remote access can be enabled or disabled on the 3DM Settings page.

To enable or disable remote access

1 Click **3DM Settings** on the menu bar.

2 In the **Remote Access** section of the 3DM Settings page, select either **Enabled** or **Disabled** in the **Allow Remote Connections** field.

The page refreshes, and a message at the top of the screen confirms that remote access has been enabled or disabled.

Setting the Incoming Port

You can set the port which 3DM uses to listen for incoming messages. If you are not sure which port would be the best to use, leave this set to the default port of 888.

To set the incoming port

1 Click **3DM Settings** on the menu bar.

2 In the **Incoming Port #** section of the 3DM Settings page, enter the port number in the **Listening Port** field.

The page refreshes, and a message at the top of the screen confirms that the listening port has been changed.

Setting the Frequency of Page Refreshes

Since the status of the drives attached to your 3ware RAID controller can change while you are viewing information about them in 3DM, it’s important to refresh the page information regularly. That way you can be assured that the information you see in 3DM is current.

You can manually refresh the information on a page by clicking **Refresh Page** in the menu bar. But you can also have 3DM refresh the information on a regular basis.

To set the frequency of page refreshes

1 Click **3DM Settings** on the menu bar.

2 In the **Page Refresh** section of the 3DM Settings page, select how often you want the page to be refreshed in the **Minutes Between Refresh** field.

Note: If you don't want 3DM to refresh the screen automatically, select **Never** in the **Minutes Between Refresh** field. You can then refresh manually by clicking Refresh on your web browser.

Running Two Versions of 3DM

Although you can view information about 7000- and 8000-series controllers in 3DM 2, some features of version 2 are only available for the 9000-series, because they require that the firmware contain associated capabilities. When this is the case, a message appears in the 3DM page indicating that the feature is not available for the current controller.

The scheduling feature is one that works differently in 9000-series controllers and earlier controllers. If you want to set the schedule for background tasks for a 7000- or 8000-series controller, you must do so by using 3DM version 1.x.

If you have multiple controllers in the same system, and the controllers are from different series, it is possible to install and run both 3DM 2 and 3DM version 1.x on the same system.

Note: If two different versions of 3DM are both running, they have to be listening on different ports.

In addition, alarms cannot be captured by both versions.

3DM 2 Reference

This section includes details about the fields and features available on the pages you work with throughout 3DM 2. It is organized by page, as the pages are organized on the 3DM menu bar.

- Controller Summary Page
- Controller Details Page
- Unit Information Page
- Unit Details Page
- Drive Information Page
- SMART Details About Drive at Particular Port Page
- Controller Settings Page
- Scheduling Page
- Maintenance Page
- Alarms Page
- 3DM Settings Page

Controller Summary Page

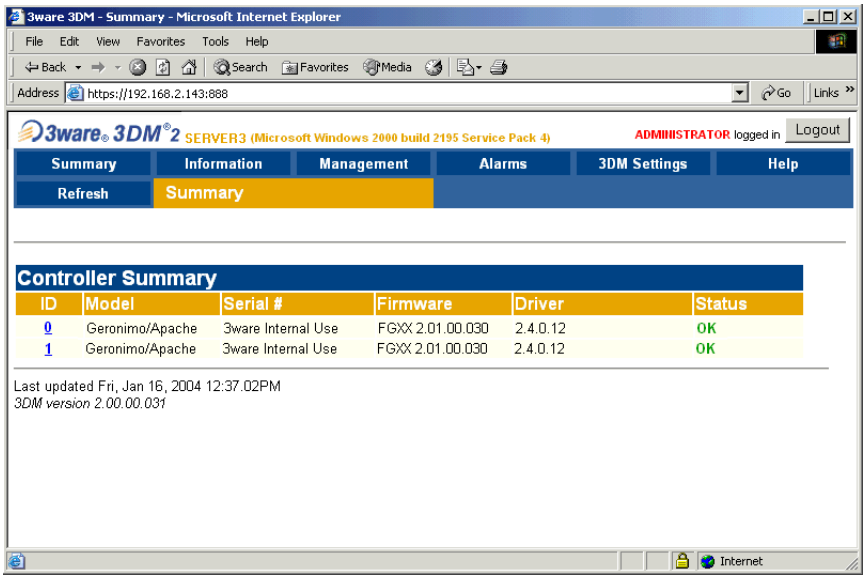
3ware 3DM - Summary - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://192.168.2.143:888
Go Links
3ware 3DM 2 SERVER3 (Microsoft Windows 2000 build 2195 Service Pack 4)
ADMINISTRATOR logged in
Logout
Summary Information Management Alarms 3DM Settings Help
Refresh
Summary
Controller Summary
ID Model Serial # Firmware Driver Status
0 Geronimo/Apache 3ware Internal Use FGXX 2.01.00.030 2.4.0.12 OK
1 Geronimo/Apache 3ware Internal Use FGXX 2.01.00.030 2.4.0.12 OK
Last updated Fri, Jan 16, 2004 12:37:02PM
3DM version 2.00.00.031
Internet

Figure 15. Controller Summary Page

Note: The software version shown in the screenshots in this manual are preliminary examples only. For the current released and tested version number, refer to the 9000 release notes.

The Summary page appears after you first logon to 3DM, and when you click the Summary link in the menu bar.

The Summary page provides basic information about each 3ware RAID controller in your system. To see details about the units in a controller, click the link in the ID column.

ID. The ID that the operating system assigns to the controller.

Note: The controller ID you see in 3DM 2 may not match the number that you see for the same controller in 3DM version 1.x.

Model. The model name of the controller. (The model number is also printed on a sticker on the outside bracket of the controller.)

Serial #. The serial number of the controller. (The serial number is also printed on a sticker on the outside bracket of the controller.)

Firmware. The firmware version running on the controller.

Driver. The driver version being used to interact with the controller.

Status. The overall status of the controller. Possible statuses include OK, Warning, Error, and No Units. **Warning** indicates that a background task is currently being performed (rebuilding, verifying, or initializing). **Error** indicates that a unit is degraded or inoperable. If both Error and Warning conditions exist, the status will appear as Error.

Controller Details Page

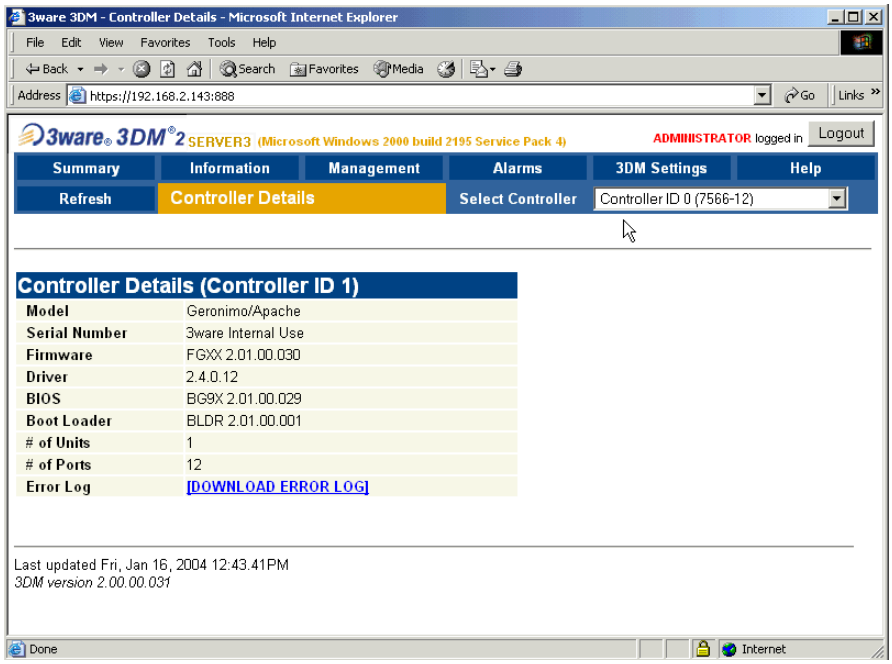

Figure 16. Controller Details Page

The Controller Details page appears when you choose **Information > Controller Details** from the menu bar.

The Controller Details page provides detailed information about the controller specified in the drop-down list on the menu bar.

You can also open or download an error log from this screen.

Model. The model name of the controller.

Serial #. The serial number of the controller.

Firmware. The firmware version running on the controller.

Driver. The driver version being used to interact with the controller.

BIOS. The BIOS version on the controller.

Monitor. The Monitor version on the controller.This field appears only for 7000- and 8000-series controllers.)

Boot Loader. Boot Loader version on the controller. This field appears only for 9000-series controllers.

# of Units. The number of units on the controller.

# of Ports. The number of total ports on the controller, regardless of whether each currently has a drive connected.

Error Log. Provides access to the firmware's error log. When you click this link, a dialog box gives you the option to save the log to your computer, or open it.

Unit Information Page

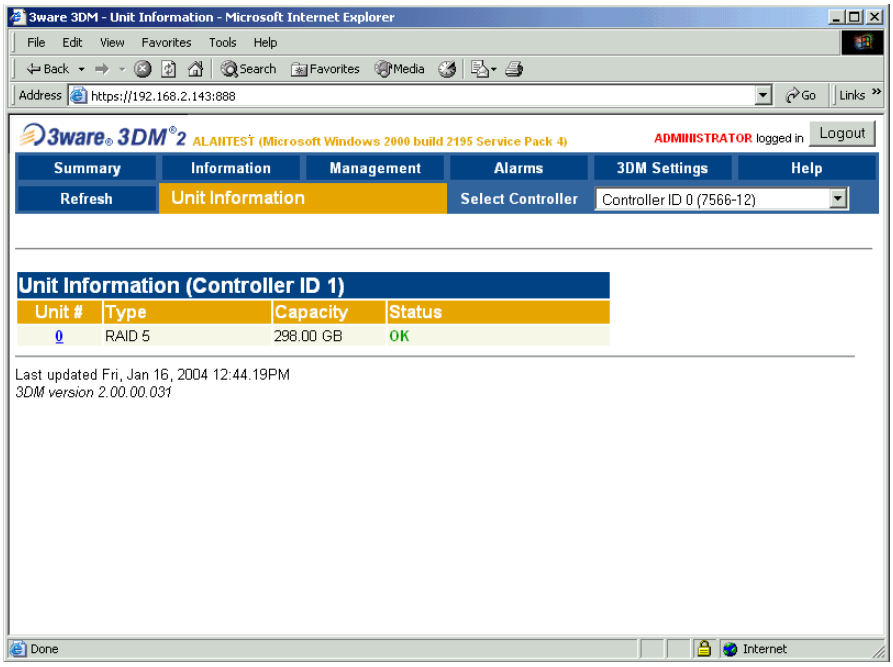

Figure 17. Unit Information Page

The Unit Information page appears when you choose **Information > Unit Information** from the menu bar, and when you click an ID number on the Controller Summary page.

The Unit Information page shows a list of the units on the controller specified in the drop-down list on the menu bar and provides summary information about each unit.

To see details about a particular unit, click the link in the Unit # column.

Unit #. The unit number assigned to the unit by the firmware. For 9000-series controllers, unit numbers are in sequential order. For 7/8000-series controllers, unit numbers begin with the lowest port number.

Type. The type of unit, specified during configuration: RAID 0, RAID 1, RAID 5, RAID 10, RAID 50, Single Disk, JBOD, or Spare. For details about each of the RAID levels, see “Understanding RAID Concepts and Levels” on page 8.

Capacity. The logical capacity (size) of the unit.

Note: 3DM 2 displays the capacity (in MBytes or GBytes) the same way that Microsoft Windows and Linux operating systems do: as 1KB = 1024 bytes. Previous versions of 3DM 1.x used the 1KB = 1000 bytes definition. Consequently capacities of units listed under 3DM v 1.x may appear to be larger than they do under 3DM 2.

Status. The operational status of the unit: OK, Rebuilding, Initializing, Verifying, Degraded, or Inoperable (missing drives). When a unit is Rebuilding, Initializing, or Verifying, the percentage (%) complete is also shown.

Unit Details Page

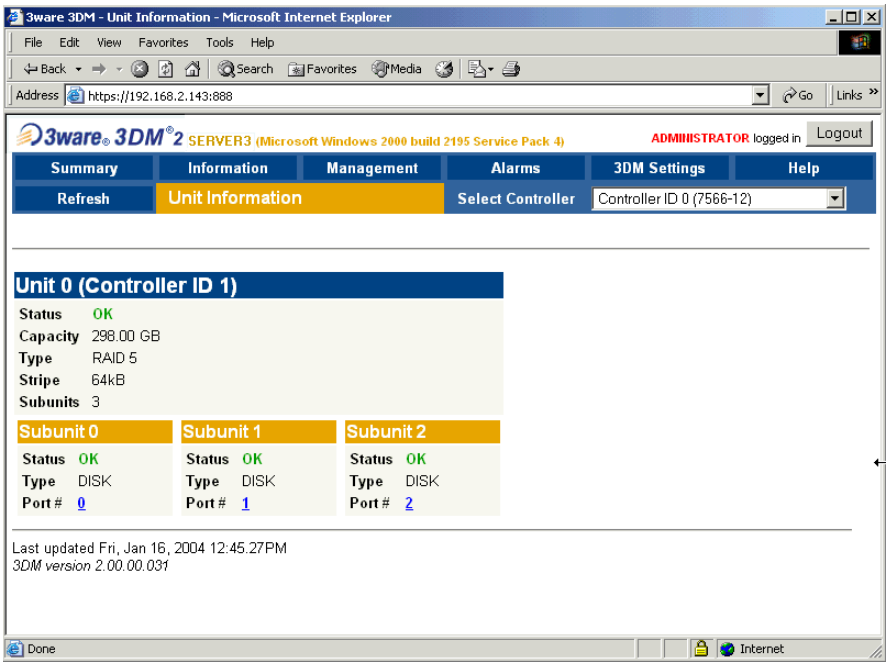

Figure 18. Unit Details Page

The Unit Details page appears when you click an ID number on the Unit Information page. Because it is a sub-page of Unit Information, the page title in the menu bar continues to display “Unit Information” even when you view details of a unit. To return to the list of units, click **Unit Information** in the menu bar.

The Unit Details page shows details about a particular unit. The specific information shown depends on what type of unit it is. For example, details about a RAID 10 unit made up of two subunits, each of which contains two drives, will include details about the unit and each subunit, as shown in

Figure 18. However, if the unit was a Single Disk, only information about one disk would be shown.

Details on this page may include all or some of the following information described below.

To see details about a particular drive, click the Port #. You'll see a list of all drives, with the drive you selected highlighted.

Status. The operational status of the unit or subunit: OK, Rebuilding, Initializing, Verifying, Degraded, or Inoperable (missing drives). When a unit is Rebuilding, Initializing, or Verifying, the percentage (%) complete is also shown.

Capacity. The total capacity of the unit (capacities of subunits are not shown).

Type. The type of unit or subunit it is. RAID 0, RAID 1, RAID 5, RAID 10, RAID 50, Single Disk, Spare, JBOD, or Disk

Stripe. The stripe size of the unit, if applicable.

Subunits. If the unit has subunits, details of the subunits are shown.

Port #. If the Type is Disk, Single Disk, JBOD, or Spare, the port to which the drive is connected is shown. For multiple drive units, the port numbers are shown in the subunits section. The port number is a link to the Drive Information page.

Drive Information Page

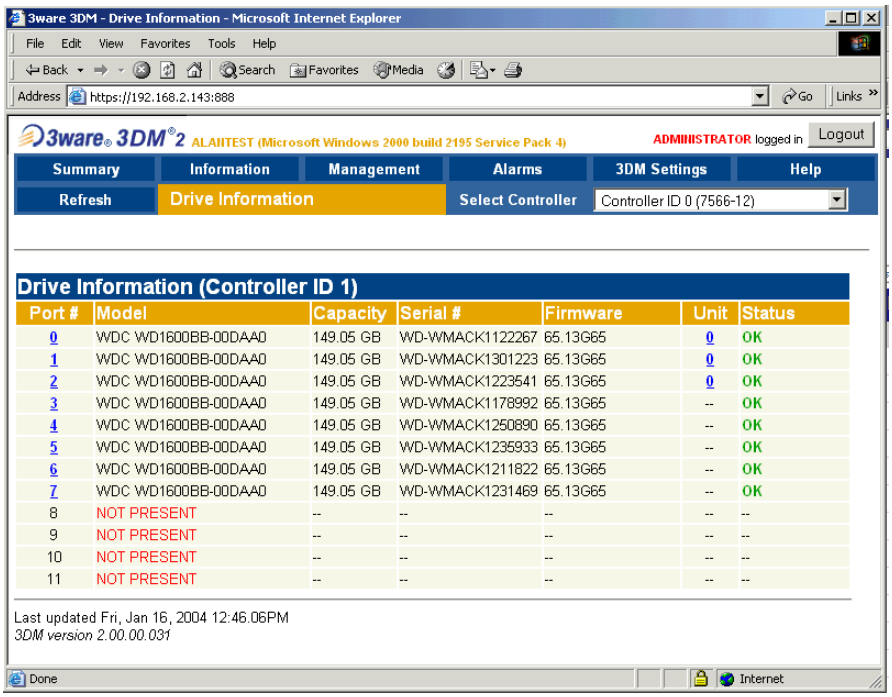
3ware 3DM - Drive Information - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address https://192.168.2.143:888
3ware 3DM 2 ALAINTEST (Microsoft Windows 2000 build 2195 Service Pack 4)
ADMINISTRATOR logged in
Logout
Summary
Information
Management
Alarms
3DM Settings
Help
Refresh
Drive Information
Select Controller
Controller ID 0 (7566-12)
Drive Information (Controller ID 1)
Port # Model Capacity Serial # Firmware Unit Status
0 WDC WD1600BB-00DAA0 149.05 GB WD-WMACK1122267 65.13G65 0 OK
1 WDC WD1600BB-00DAA0 149.05 GB WD-WMACK1301223 65.13G65 0 OK
2 WDC WD1600BB-00DAA0 149.05 GB WD-WMACK1223541 65.13G65 0 OK
3 WDC WD1600BB-00DAA0 149.05 GB WD-WMACK1178992 65.13G65 -- OK
4 WDC WD1600BB-00DAA0 149.05 GB WD-WMACK1250890 65.13G65 -- OK
5 WDC WD1600BB-00DAA0 149.05 GB WD-WMACK1235933 65.13G65 -- OK
6 WDC WD1600BB-00DAA0 149.05 GB WD-WMACK1211822 65.13G65 -- OK
7 WDC WD1600BB-00DAA0 149.05 GB WD-WMACK1231469 65.13G65 -- OK
8 NOT PRESENT
9 NOT PRESENT
10 NOT PRESENT
11 NOT PRESENT
Last updated Fri, Jan 16, 2004 12:46:06PM
3DM version 2.00.00.031
Done
Internet

Figure 19. Drive Information Page

The Drive Information page appears when you choose **Information > Drive Information** from the menu bar, or when you click a port # on the Unit Details page. If you arrive at this page from the port # hyperlink on the Unit Information page, the line showing the port # you clicked on is highlighted.

The Drive Information page shows a list of drives on the controller specified in the drop-down list on the menu bar, and a summary of each one.

To see the SMART data for a drive, click the link in the Port # column.

Port #. The port to which the drive is connected.

Model. The model of the drive.

Capacity. The physical capacity of the drive. (Note that the capacity as shown on 3DM screen is calculated as 1KB = 1024. This amount may differ from the capacity that is printed on the disk drive, where it typically has been calculated as 1K = 1000. Consequently, the capacity of the drive may appear smaller in the 3DM screens. No storage capacity is actually lost; the size has simply been calculated differently for consistency.

Serial #. The serial number of the drive.

Firmware. The firmware version of the drive.

Unit. The unit the drive belongs to, if applicable.

Status. The status of the drive: OK, Not Supported, Read Timeout, Read Failure, Orphan, DCB Data Check, Unsupp DCB, Unconv DCB, Offline JBOD, or Not Present. (In the event of a problem, the status shown for the drive can be useful to customer support.)

Note: In most cases, the status of the drive will not correspond to the status of the unit, shown on the Unit Information page.

SMART Details About Drive at Particular Port Page

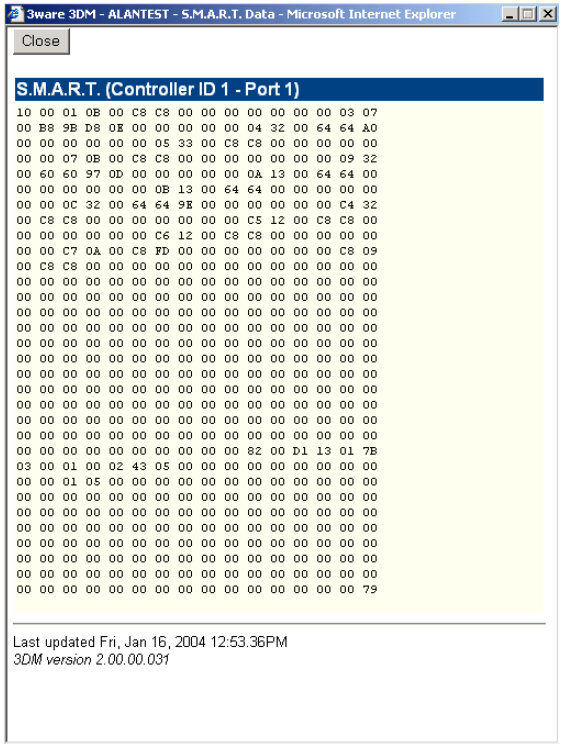

Figure 20. S.M.A.R.T Data Page

The SMART Details page appears when you click a Port # on the Drive Information page.

SMART data is displayed as hex values.

Consult your disk drive manufacturer for information on how to interpret the SMART data. The SMART data meaning varies by disk drive manufacturer and model.

Controller Settings Page

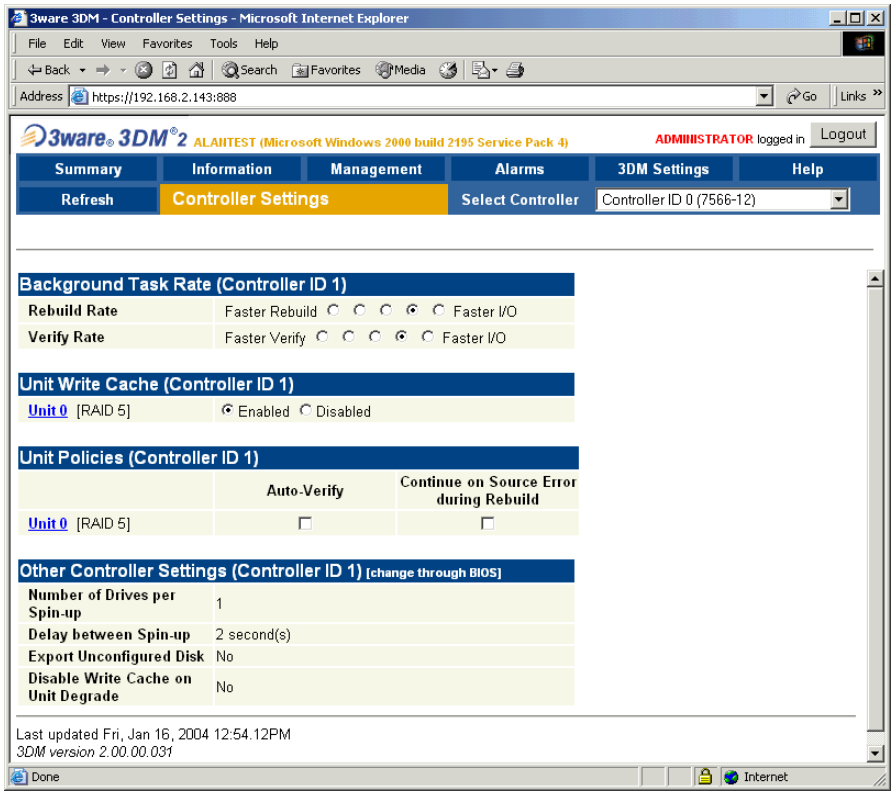

Figure 21. Controller Settings Page

The Controller Settings page appears when you choose **Management > Controller Settings** from the menu bar.

The Controller Settings page lets you view and change settings that affect the units on the controller specified in the drop-down list on the menu bar.

Background Task Rate

The Background Task Rate fields let you change the balance of background tasks (rebuild and verify) and I/O performed by the controller.

9000-series controllers show separate settings for Rebuild Rate and Verify Rate, as shown in Figure 21. 7000- and 8000-series controllers show only one setting for Task Rate; it applies to both rebuild and verify rates.This rate is not persistent following a reboot for 7/8000.

The 5 radio buttons let you set the ratio at which rebuilds and verifies are performed. The furthest left buttons set the firmware to the fastest rebuild and verify settings. This means, maximum processing time will be given to rebuilds or verifies rather than I/O. The furthest right buttons set the firmware to the slowest rebuild and verify settings, giving maximum processing time to I/O.

For additional information, see“Setting Background Task Rate” on page 113.

Unit Write Cache

You can enable or disable write cache for each unit.3DM lists each unit on the controller specified in the drop-down list on the menu bar, and shows you whether the write cache is currently enabled or disabled for it.

Write cache is a combination of the physical hard drives’ write cache as well as the controller’s memory, depending on what type of unit you are using.

For 9000-series controllers, a **Disable Write Cache on Unit Degrade** setting can be set in 3ware BIOS Manager (3BM). You can see if this setting is enabled in the **Other Controller Settings** field at the bottom of this Controller Settings page. If **Disable Write Cache on Unit Degrade** is enabled, upon degrade of a unit, the write cache will automatically be disabled, even if you enable write cache in the Unit Write Cache field.

For additional information, see “Enabling and Disabling the Unit Write Cache” on page 89.

Unit Policies

For units on 9000-series controllers, you can enable or disable two policies: **Auto-verify** and **Continue on Source Error During Rebuild**. 3DM lists each unit on the controller specified in the drop-down list on the menu bar, and shows you whether the policies are currently enabled or disabled for each unit.

This section does not appear for 7000- and 8000- series controllers.

Auto-verify. The Auto-verify policy causes verify tasks to be performed repeatedly during a scheduled verify window. When Auto-verify is disabled, verify is not initiated automatically by the controller. Verify can still be started manually with 3DM, 3BM, or CLI. Once a manually-started verification is complete, no further verify tasks for the unit is performed.

Continue on Source Error During Rebuild. This policy applies only to units which are redundant. (For units which are not redundant, a check box is not available.) When this policy is set, ECC errors are ignored when they are encountered during a rebuild. When this policy is not set, a rebuild will abort upon encountering an ECC error and the unit will be set back to Degraded.

Since this option could result in the loss of some source data in the event of source errors, select this option only if you want to ensure that a rebuild will complete successfully without manually intervention. If the rebuild fails and **Continue on Source Error During Rebuild** is not selected, then you have the option to start a rebuild manually. It is recommended that a file system check be executed when the rebuild completes.

Note: The policy **Continue on Source Error During Rebuild** is equivalent to the "Force continue on source errors" option in 3DM v 1.x and the "ignoreEcc" option in the CLI.

Other Controller Settings

For 9000-series controllers, the Other Controller settings displays information about additional settings that can only be changed in the BIOS (3BM). For more information see "Setting Policies for a Controller through 3BM" on page 74.

This section does not appear for 7000- and 8000- series controllers.

Number of Drives Per Spin-up. Number of drives that will spin up at the same time when the controller is powered up. (This setting only applies when the feature is supported by the disk drives and has been enabled in 3BM.)

Delay between Spin-ups. The delay between drive groups that spin up at one time on this particular controller.

Export JBOD (Unconfigured) Disks. Indicates whether unconfigured disks (JBODs) should be exported to the operating system. By default, this setting is disabled. For more information about this feature, see "Exporting JBOD Disks" on page 75.

Disable Write Cache on Unit Degrade. Indicates whether write cache will be automatically disabled on a unit if it becomes degraded. After the unit is rebuilt, the write cache will be re-enabled automatically.

Scheduling Page

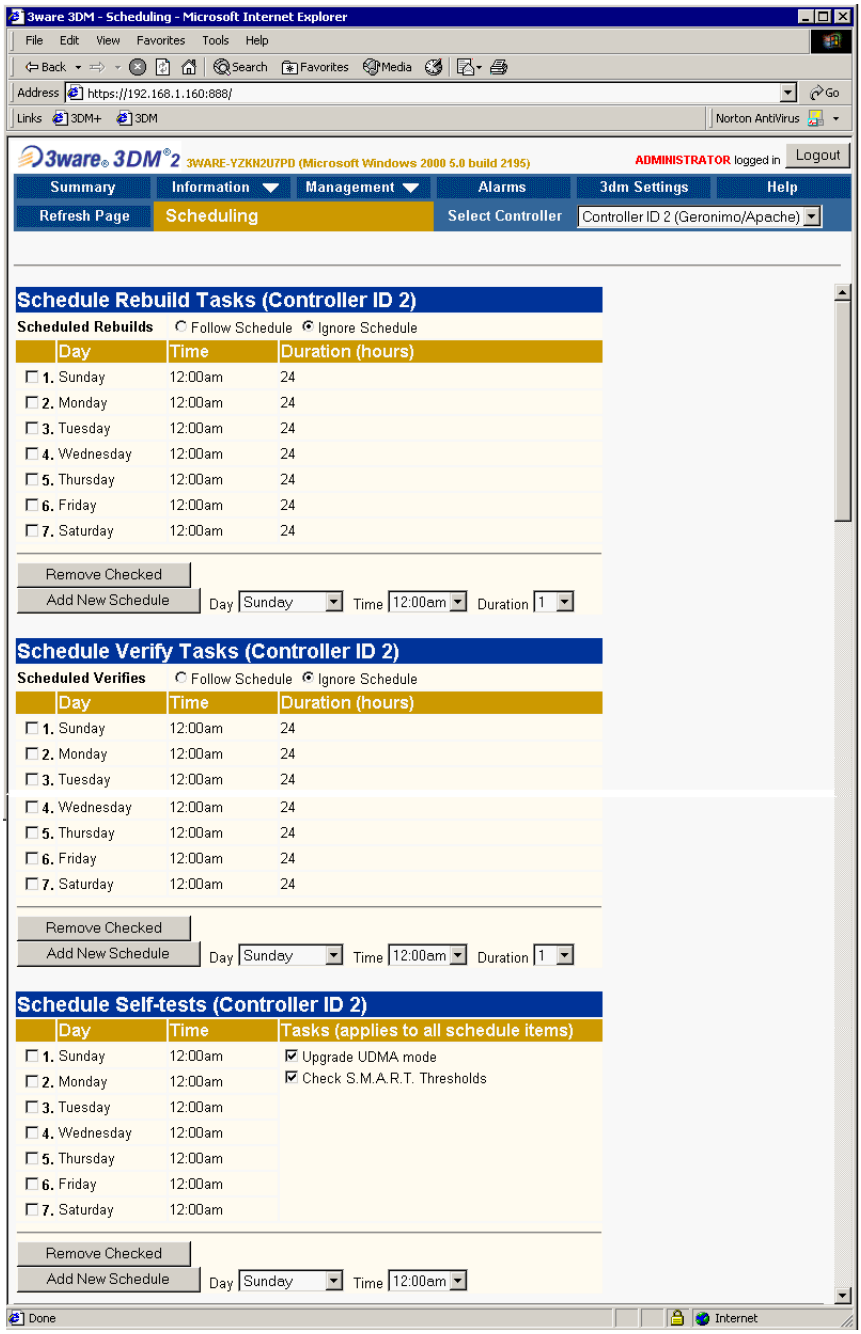

Figure 22. Scheduling Page

For 9000-series controllers, the Scheduling page appears when you choose **Management > Scheduling** from the menu bar.

The Scheduling page is not available for 7000- and 8000- series controllers. If you want to schedule tasks for one of those controllers, use 3DM Version 1.x.

The Scheduling page lets you view and change the schedule for tasks that affect all units on the controller specified in the drop-down list on the menu bar, including:

- Rebuild tasks (also applies to initialization tasks)
- Verify tasks (also applies to media scans)
- Self-tests

You can also enable or disable use of the schedule for Rebuild and Verify tasks by selecting either **Follow Schedule** or **Ignore Schedule**. When these schedules are set to be ignored, these tasks can be performed at any time, and are not restricted to the scheduled times.

Note: Scheduling of these tasks is only available on the 9000-series controllers.

For details about the different background tasks, see "About Background Tasks" on page 109.

About Task Schedules

Each type of task may be scheduled for up to 7 times per week. This limits active initializing, rebuilding, verifying, and testing of a unit to the times you specify, so that the task does not interfere with peak I/O times.

If all 7 schedule slots are filled, you must first remove one or more schedule times before you can add another.

You may set schedule times whether scheduling is set to be followed or ignored. This is useful if you want to temporarily disable the schedule.

If you remove all the schedule times for a particular background task, initializations and rebuilds will run anytime, as they are needed. Verify will only run if started by the CLI or if the Verify Unit button is clicked.

For information about adding and removing schedules, and setting schedules to be followed or ignored, see "Scheduling Background Tasks" on page 114

About Self-tests

Unlike scheduling of rebuilds and verifies, scheduling of self-tests is always followed. To disable self-tests you either remove all schedule times, or uncheck the tests listed in the Tasks column.

Note: Only the checked tasks will be run during the scheduled times. If none of the tasks are checked, self-tests will never run, even if you have scheduled time slots set.

Two self-tests can be scheduled:

Upgrade UDMA mode. This test checks the speed at which data transfer to drives is occurring, to see if the UDMA mode can be increased. (If you are already running at the fastest UDMA mode, then this self-test has no effect.)

The UDMA mode can become downgraded in the event that cable CRC errors are encountered, requiring multiple retries to read sectors. In severe cases, the UDMA mode may be downgraded from ATA 150 to ATA 133, to ATA 100, to 66, to 33.

This check is also done every time the system is booted.

UDMA mode does not apply to SATA.

Check SMART Thresholds. This test checks to see whether SMART thresholds have been exceeded.

The SMART thresholds indicate when a drive is likely to fail, based on the number of errors that have been recorded through SMART (Self-Monitoring, Analysis and Reporting Technology).

If any of the disk drives have detected a “threshold exceeded” condition, then an AEN is logged to the 3DM Alarms page. Moreover, if anything unusual is found during any self-test, it will be logged as an Alarm.

Maintenance Page

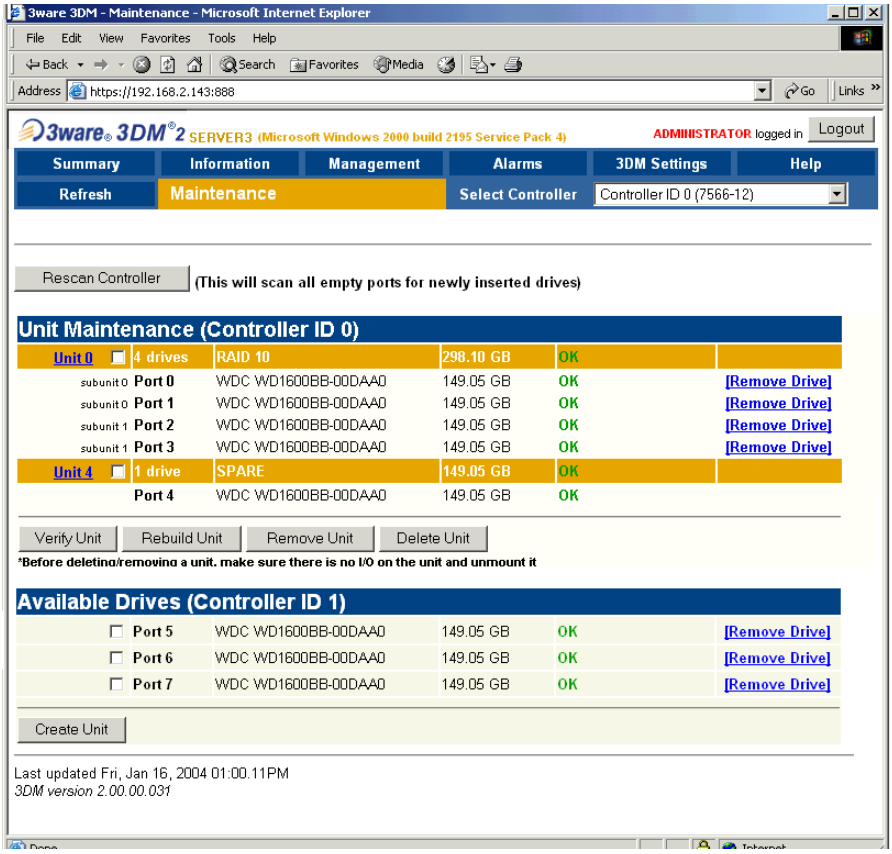
3ware 3DM - Maintenance - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address https://192.168.2.143:888
3ware 3DM 2 SERVER3 (Microsoft Windows 2000 build 2195 Service Pack 4)
ADMINISTRATOR logged in
Logout
Summary
Information
Management
Alarms
3DM Settings
Help
Refresh
Maintenance
Select Controller
Controller ID 0 (7566-12)
Rescan Controller
(This will scan all empty ports for newly inserted drives)
Unit Maintenance (Controller ID 0)
Unit 0
4 drives
RAID 10
298.10 GB
OK
subunit 0 Port 0 WDC WD1600BB-00DAA0 149.05 GB OK [Remove Drive]
subunit 0 Port 1 WDC WD1600BB-00DAA0 149.05 GB OK [Remove Drive]
subunit 1 Port 2 WDC WD1600BB-00DAA0 149.05 GB OK [Remove Drive]
subunit 1 Port 3 WDC WD1600BB-00DAA0 149.05 GB OK [Remove Drive]
Unit 4
1 drive
SPARE
149.05 GB
OK
Port 4 WDC WD1600BB-00DAA0 149.05 GB OK
Verify Unit
Rebuild Unit
Remove Unit
Delete Unit
*Before deleting/removing a unit, make sure there is no I/O on the unit and unmount it
Available Drives (Controller ID 1)
Port 5 WDC WD1600BB-00DAA0 149.05 GB OK [Remove Drive]
Port 6 WDC WD1600BB-00DAA0 149.05 GB OK [Remove Drive]
Port 7 WDC WD1600BB-00DAA0 149.05 GB OK [Remove Drive]
Create Unit
Last updated Fri, Jan 16, 2004 01:00.11PM
3DM version 2.00.00.031

Figure 23. Maintenance Page

The Maintenance page appears when you choose **Management > Maintenance** from the menu bar.

The Maintenance page lets you perform maintenance tasks on existing units on the current controller (shown in the drop-down list on the menu bar), and lets you create new units by configuring available drives.

Rescan Controller

Use the **Rescan Controller** button to have 3DM scan the available drives in the controller and update the list of available drives shown. This is useful in variety of maintenance tasks. For example, if you physically plug in a drive and want the controller to recognize the newly plugged in drive.

Note: If you unplug a drive without first removing it through 3DM, Rescan will not recognize it as gone unless the drive was in use or until it is required by the system. Always use the **Remove** link to remove a drive before unplugging it.

Warning: Removing or adding drives which are not in hotswap carriers can result in a system hang or may even damage the system and the drive.

In 9000-series controllers, rescan checks empty ports for newly plugged in drives. If those drives were previously part of a 3ware RAID configuration and they still have valid DCB (Disk Configuration Block) information on them, the controller tries to piece them back together into a working unit. If a working unit can be formed, it will appear in the Unit Maintenance list when the scan is complete, and the operating system will be notified of the unit. In Linux or FreeBSD, a device node will be associated with each unit created. In Windows the device manager will reflect the changes under the disk drives icon. This process is known as importing drives.

If new drives do not have any data indicating they were previously part of a 3ware RAID configuration, they will appear in the Available Drives list.

In addition, if there is a unit with the status Inoperable before a rescan (for example, a RAID 5 unit missing 2 or more drives), and a rescan finds drives that complete the unit, the inoperable unit will become a valid unit.

Note: In 8000-series controllers, only JBOD units can be removed and rescanned while keeping the data intact. Clicking **Rescan Controller** after removing units other than a JBOD unit (e.g. RAID 5) will cause the drives that make up the unit to be seen as individual available drives; they will not be pieced together to form a unit. This is unlike the 9000 series controllers, which will piece together the unit for you and display the drives as a unit. If you still want to use the drives together as a unit, restart the computer before creating a new unit with those drives. Creating a new unit with those drives will destroy any existing data on them. After you restart, the 8000 will again see the drives as a valid unit.

Unit Maintenance

The Unit Maintenance section of the page lists all existing units on the current controller, and displays summary information about them.

The top row shows information about the unit, while subsequent rows show summary information about each drive in the unit.

Unit Information

Unit Number. The unit number assigned to the unit by the firmware. Unit numbers for 9000 series are in sequential order. Unit numbers for the 7/8000 series will begin with the lowest port number of the unit. Use the checkbox next to the unit to select a unit before clicking one of the task buttons.

 # Drives. Number of drives in the unit.

Type of Unit. Type of unit specified during configuration: RAID 0, RAID 1, RAID 5, RAID 10, RAID 50, Single Disk, Spare, or JBOD.

Capacity. The usable capacity (size) of the unit.

Status. Operational status of the unit: Ok, Rebuilding, Initializing, Verifying, Degraded, or Inoperable (missing drives). When Rebuilding, Initializing, or Verifying, the percentage (%) complete is also shown. The % complete can be active or paused. To see whether this task is currently active or paused, click on the unit number to display the Unit Information page, which has that information.

Drive Information

Port. The port to which the drive is connected.

Model. The model of the drive.

Capacity. The capacity (size) of the drive.

Status. The status of the drive: OK, Not Supported, Not Present, and so forth. If you need help regarding a status displayed here, please contact Technical Support.

Remove Drive. The **Remove Drive** link removes a drive from the controller so that you can safely unplug it. In the Unit Maintenance section, this link is only provided for drives that can be safely removed without creating an inoperable unit. (For example, a RAID 5 missing 2 or more drives or a RAID 0 missing 1 or more drives would become inoperable.) If you remove a drive from a redundant unit, the unit will become degraded. Once a unit has become degraded, additional drives cannot be removed without making it inoperable, so no **Remove Drive** link will display.

Warning: Physically removing drives which are not in hotswap carriers can result in a system hang or may even damage the system and the drive.

Maintenance Task Buttons

Below the list of units, a row of task buttons lets you preform maintenance and configuration tasks related to the unit. Before clicking one of these buttons, select the appropriate unit.

Verify Unit. Puts the selected unit in verifying mode. If verify scheduling is enabled on the Scheduling page, the unit will not start actively verifying until the scheduled time, and the status will indicate “Verify-Paused.” (The Unit Details page will indicate whether a unit is actively verifying.) If verify scheduling is not enabled, clicking **Verify Unit** begins the verification process.

If the unit you selected to verify is a redundant unit, the redundancy of the unit will be verified. For example it will check parity for a RAID 5 or check data consistency for a RAID 1. If the unit you checked is not a redundant unit, verify will do a surface scan of the media. During verification, I/O continues normally. For RAID 0, single disks, JBODs, and spares, there is only a slight performance loss. For redundant units, you can set the background task rate on the Controller Settings page to specify whether more processing time should be given to verifying or to I/O.

While a unit is verifying, the status changes to Verifying and a **Stop Verify** link appears in the right-most column of the Unit Maintenance table.

Note: If the unit has not previously been initialized and you click **Verify Unit**, the initialization process starts. Initialization cannot be halted, so no Stop Verify link appears. (Initialization can be paused, however, through Scheduling. Initialization follows the Rebuild schedule, so turning on scheduling for Rebuild will pause initialization, as well.) For more information about initialization, see “About Initialization” on page 109.

Rebuild Unit. Replaces a degraded drive in a degraded unit with an available drive and begins rebuilding the RAID. When you select a degraded unit and click **Rebuild Unit**, a dialog box listing available drives appears, so that you can select the drive you want to use. If the degraded unit has more than one degraded drives (for example, a RAID 10 where both mirrored pairs each have a degraded drive), you will repeat this process a second time.

If rebuild scheduling is enabled on the Scheduling page, the unit will not start actively rebuilding until the scheduled time, and the status will change to say “Rebuild-Paused.” (The Unit Details page indicates whether a unit is actively rebuilding.) If rebuild scheduling is not enabled, the rebuild process will begin right away.

Remove Unit. Removes a selected unit and allows you to unplug the drives and move the unit to another controller. the data on the unit remain intact.

Caution: Before you click **Remove Unit**, make sure the unit you are removing is unmounted and no I/Os are being issued. (For example, make sure you are not copying files to the unit, and make sure that there are no applications with open files on that unit.)

If a unit is not unmounted and you remove it, it is the equivalent of physically yanking a hard drive out from under the operating system. Resulting behavior depends on which operating system you are using and what kind of I/O is being done, however you will typically see really bad results, bad errors, and most likely a reset of the controller or a system hang.

To unmount a unit under windows, use Administrative Tools > Computer Management > Disk Management. In the Computer Management window, right-click on the partition and Remove the logical drive letter associated with the unit.

To unmount a unit under Linux, unmount the mount point to where the RAID unit is mounted. For example, if you want to remove unit 0 and you know that 0 corresponds to /dev/sdb, you should unmount all partitions for sdbx (where x is the number of the partition).

```
umount /dev/sdbx
```

For FreeBSD, the command would be

```
umount /dev/twedx
```

When you click **Remove Unit**, you will be asked to confirm that you want to proceed. When you confirm the removal, the unit number and information will be removed from 3DM. (Units created in the future can reclaim this unit number.)

The operating system is notified that the unit was removed. In Linux the device node associated with this unit is removed. In Windows the Device Manager will reflect the changes under the disk drives icon.

Information about the unit remains intact on the drives. This allows the drive or drives to be reassembled into a unit again on this controller, or if moved to another controller.

Warning: Physically removing drives which are not in hotswap carriers can result in a system hang or may even damage the system and the drive.

Delete Unit. Deletes the selected unit and allows you to use the drives to create another unit. The drives appear in the list of Available Drives.

Caution: Before you click **Delete Unit**, make sure the unit you are removing is unmounted and no I/Os are being issued. If a unit is not unmounted and you delete it, it is the equivalent of physically yanking a hard drive out from under the operating system. Resulting behavior depends on which operating system you are using and what kind of I/O is being done, however you will typically see really bad results, bad errors, and most likely a reset of the controller or a system hang.

Devices can be unmounted through the operating system. For details, see the discussion under **Remove Unit**, above.

Warning: When a unit is deleted, the data will be permanently deleted: the drives cannot be reassembled into the same unit. If you want to reassemble the drives on another controller and access the existing data, use **Remove Unit** instead of **Delete Unit**.

After deletion, the operating system is notified that the unit was deleted. In Linux the device node associated with this unit is removed. In Windows the Device Manager will reflect the changes under the disk drives icon.

Available Drives (to Create Units)

This section lists the drives on the controller which are not currently configured as part of a unit. The Port number, model, capacity, and status are all displayed, as they are for drives in existing units.

Remove Drive. The Remove Drive link removes a drive from the controller so that you can safely unplug it. Any drive in the Available Drives list can be removed.

Warning: Physically removing drives which are not in hotswap carriers can result in a system hang or may even damage the system and the drive.

Create Unit

Use the **Create Unit** button to create a unit for use on the current controller. Begin by selecting the drives you want to use in the list of Available Drives, and then click **Create Unit**. You will be prompted to select the unit Type, Stripe size (if applicable), Write Cache, and Auto Verify settings.

A window like the one in Figure 24 shows the drives you selected, and lets you specify configuration settings.

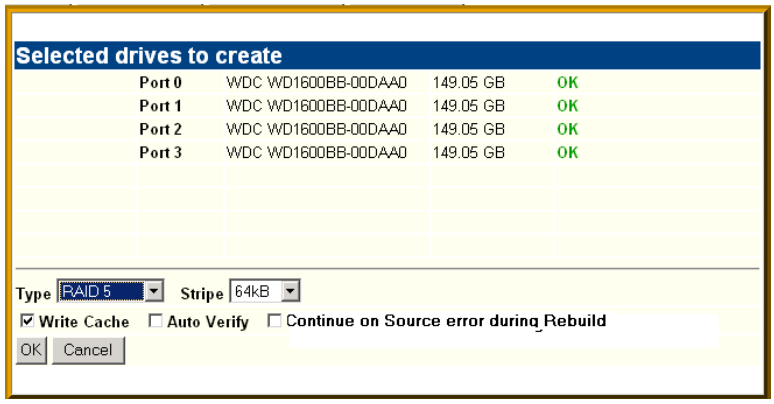
Selected drives to create
Port 0 WDC WD1600BB-00DAA0 149.05 GB OK
Port 1 WDC WD1600BB-00DAA0 149.05 GB OK
Port 2 WDC WD1600BB-00DAA0 149.05 GB OK
Port 3 WDC WD1600BB-00DAA0 149.05 GB OK
Type RAID 5 Stripe 64kB
Write Cache Auto Verify Continue on Source error during Rebuild
OK Cancel

Figure 24. Configuring a Unit in 3DM

For more detailed instructions, see “Creating a Unit through 3DM” on page 82.

Type. The drop-down list lists the possible RAID configurations for the drives selected in the list of Available Drives. Available configurations may include RAID 0, RAID 1, RAID 5, RAID 10, RAID 50, Single Disk, and Spare Disk. For information about these configurations, see “Available RAID Configurations” on page 9.

When you are configuring a RAID 50 with twelve drives, an additional field appears, in which you select the number of drives per subunit—3, 4, or 6.

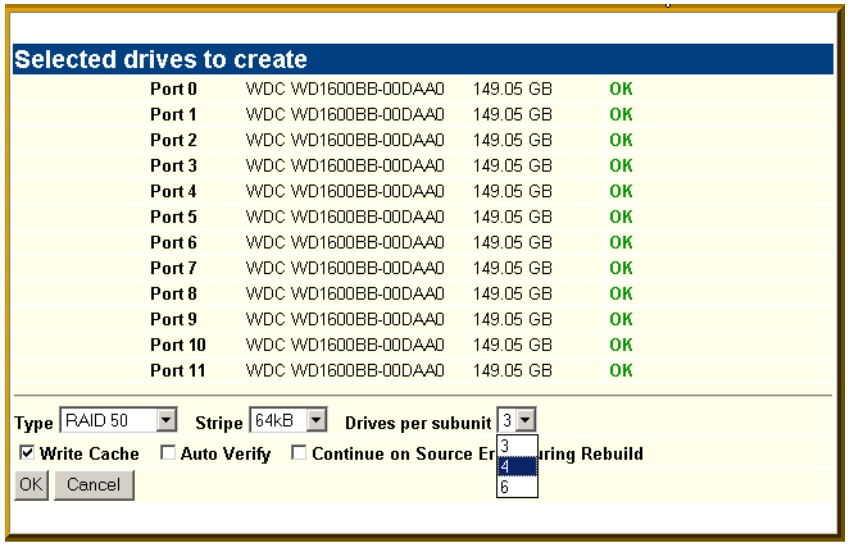
Selected drives to create
Port 0 WDC WD1600BB-00DAA0 149.05 GB OK
Port 1 WDC WD1600BB-00DAA0 149.05 GB OK
Port 2 WDC WD1600BB-00DAA0 149.05 GB OK
Port 3 WDC WD1600BB-00DAA0 149.05 GB OK
Port 4 WDC WD1600BB-00DAA0 149.05 GB OK
Port 5 WDC WD1600BB-00DAA0 149.05 GB OK
Port 6 WDC WD1600BB-00DAA0 149.05 GB OK
Port 7 WDC WD1600BB-00DAA0 149.05 GB OK
Port 8 WDC WD1600BB-00DAA0 149.05 GB OK
Port 9 WDC WD1600BB-00DAA0 149.05 GB OK
Port 10 WDC WD1600BB-00DAA0 149.05 GB OK
Port 11 WDC WD1600BB-00DAA0 149.05 GB OK
Type RAID 50 Stripe 64kB Drives per subunit 3
3
4
6
Write Cache Auto Verify
ring Rebuild
OK Cancel

Figure 25. Configuring a RAID 50 with 12 Drives

Stripe. The drop-down list of stripe sizes lists the possible stripe sizes for the configuration you selected in the RAID level drop-down.

The default stripe size of 64KB will give the best performance with applications that have many sequential reads and writes. A larger stripe size will give better performance with applications that have a lot of random reads

and writes. In general, the smaller the stripe size, the better the sequential I/O and the worse the random I/O. The larger the stripe size, the worse the sequential I/O and the better the random I/O.

Write Cache, Auto-Verify, and Continue on Source Error during Rebuild. These check boxes let you set the policies for the unit. These policies can also be set and changed on the Controller Settings page. For details about these policies, see "Unit Policies" on page 54.

Note: If the configuration window disappears while you are selecting drives, 3DM 2 may have refreshed. Click **Create Unit** again. If desired, you can reduce the frequency with which information refreshes in 3DM 2, or disable refresh temporarily, on the 3DM Settings page.

Alarms Page

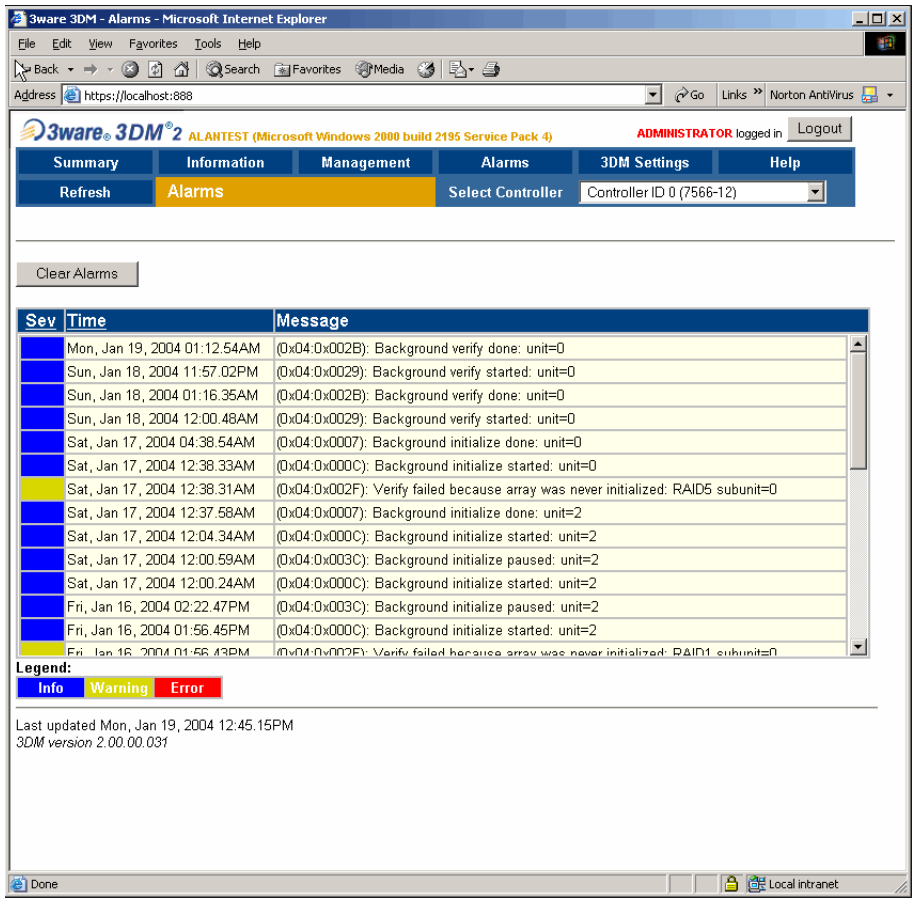
3ware 3DM - Alarms - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://localhost:888
Go Links Norton AntiVirus
3ware 3DM 2 ALANTEST (Microsoft Windows 2000 build 2195 Service Pack 4)
ADMINISTRATOR logged in Logout
Summary Information Management Alarms 3DM Settings Help
Refresh Alarms Select Controller Controller ID 0 (7566-12)
Clear Alarms
Sev Time Message
Mon, Jan 19, 2004 01:12.54AM (0x04:0x002B): Background verify done: unit=0
Sun, Jan 18, 2004 11:57.02PM (0x04:0x0029): Background verify started: unit=0
Sun, Jan 18, 2004 01:16.35AM (0x04:0x002B): Background verify done: unit=0
Sun, Jan 18, 2004 12:00.48AM (0x04:0x0029): Background verify started: unit=0
Sat, Jan 17, 2004 04:38.54AM (0x04:0x0007): Background initialize done: unit=0
Sat, Jan 17, 2004 12:38.33AM (0x04:0x000C): Background initialize started: unit=0
Sat, Jan 17, 2004 12:38.31AM (0x04:0x002F): Verify failed because array was never initialized: RAID5 subunit=0
Sat, Jan 17, 2004 12:37.58AM (0x04:0x0007): Background initialize done: unit=2
Sat, Jan 17, 2004 12:04.34AM (0x04:0x000C): Background initialize started: unit=2
Sat, Jan 17, 2004 12:00.59AM (0x04:0x003C): Background initialize paused: unit=2
Sat, Jan 17, 2004 12:00.24AM (0x04:0x000C): Background initialize started: unit=2
Fri, Jan 16, 2004 02:22.47PM (0x04:0x003C): Background initialize paused: unit=2
Fri, Jan 16, 2004 01:56.45PM (0x04:0x000C): Background initialize started: unit=2
Legend:
Info Warning Error
Last updated Mon, Jan 19, 2004 12:45.15PM
3DM version 2.00.00.031
Done
Local intranet

Figure 26. Alarms Page

The Alarms page appears when you click **Alarms** on the menu bar.

This page displays a list of AENs (asynchronous event notifications) received from the controller displayed in the drop-down list in the menu bar.

Up to 1000 alarms can be listed. After the 1000-limit is reached, the oldest alarms are deleted, as new ones occur.

You can sort the alarms by severity or time. To do so, just click the column header.

For 8000 and 9000-series controllers, alarms can be used by either 3DM or CLI, but not both. Whichever issues an alarms command first determines which can see alarm data.

Clear Alarms. The **Clear Alarms** button removes all alarms shown in the list.

Sev. Shows the severity of the event. Three levels are provided:

- Errors are shown next to a red box
- Warnings are shown next to a yellow box
- Information is shown next to a blue box

Time. The time shown for alarms generated by 7000- and 8000- series controllers is the time retrieved from the driver by 3DM. The time shown for alarms generated by 9000-series controllers is the time received by the driver from firmware.

Message. The specific text relating to the alarm condition.

3DM Settings Page

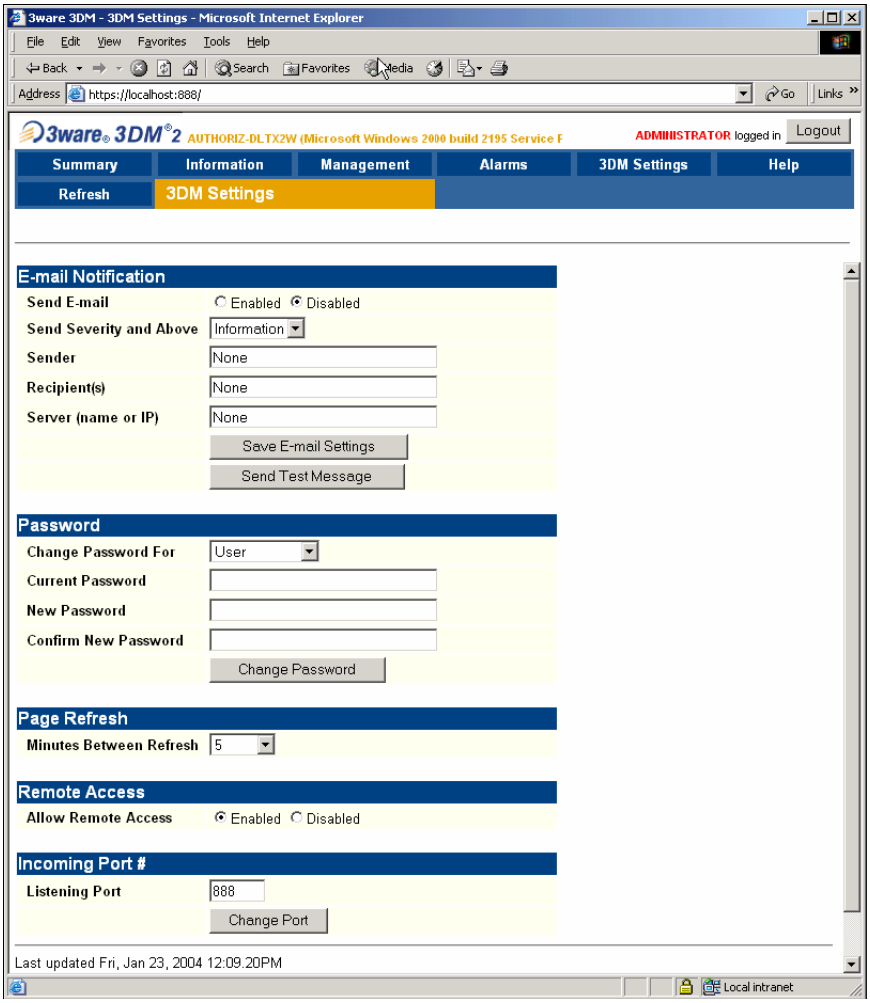

Figure 27. 3DM Settings Page

The 3DM Settings page appears when you click **3DM Settings** on the menu bar. Use this page to set preferences, including email notification for alarms, passwords, page refresh frequency, whether remote access is permitted, and the incoming port for 3DM to listen for requests.

The initial settings for most of these preferences are specified during installation of 3DM.

E-mail Notification

Use the fields in this section to set up and manage notifications of events by e-mail.

Send E-mail. This field determines whether e-mail notification is **Enabled** or **Disabled**.

Send Severity and Above. Specifies the type of events for which notifications should be sent. A severity of **Information** will send e-mails for all alarms, a severity of **Warning** will send e-mail for alarms with severity of Warning and Error. A severity of **Error** will send e-mail for alarms with severity of Error.

Sender. Enter the email address which will appear in the "From" field.

Recipient. The e-mail address to which notifications should be sent. You can enter multiple addresses, separated by commas (,).

Server (name or IP). If the machine on which you are running 3DM has access to a nameserver, you may enter the machine name of the mail server in the Server field. Otherwise, use the IP address.

Save E-mail Settings button. Saves the e-mail notification settings.

Send Test Message button. Sends a test message using the saved e-mail settings.

Password

Use the fields in this section to set the passwords for the User and Administrator. When 3DM is first installed, the default password for both is `3ware`.

Change Password For. Select the access level for which you are setting the password: **User** or **Administrator**. Users can only view status information in 3DM, while Administrators can make changes and administer the controller and associated drives.

Current Password. Enter the current password.

New Password. Enter the new password.

Confirm New Password. Enter the new password a second time, to be sure you have entered it correctly.

Change Password button. Saves password changes.

Page Refresh

Minutes Between Refresh. Displays how frequently pages in 3DM will be refreshed with new data from the controller. To change this setting, select another option from the drop-down. If you prefer 3DM to only refresh when you click **Refresh Page**, select **Never**.

The Login, Help and Drive SMART data pages do not automatically refresh. All other 3DM pages do.

Remote Access

Allow Remote Connections. This field enables or disables the ability for users and administrators to access 3DM from a remote computer.

Incoming Port

Listening Port. This field specifies the HTTP: port to be used by 3DM when listening for communications. The default port setting is 888.

If you change this port, make sure the port you specify is not being used. Failure to do so will cause 3DM to stop responding and you will have to restart it by hand.

Change Port button. Saves a new port number.